ARCHEOLOGICAL TESTING AT FOUR SITES ON THE PINON CANYON MANEUVER SITE, LAS ANIMAS COUNTY, COLORADO

by
Amy Nelson, Mona Charles, Randy Nathan, and Philip Duke

with contributions by
Daniel R. Bach
Cerisa Reynolds

Department of Anthropology,
Fort Lewis College, Durango, CO
Cooperative Agreement Number CA-6000-A9-003

Research administered by
Midwest Archeological Center, National Park Service, Lincoln, NE

Prepared for and funded by:
The Directorate of Environmental Compliance and Management, Fort Carson, CO

Fort Carson Cultural Resource Management Series Contribution Number 16

2007

ARCHEOLOGICAL TESTING AT FOUR SITES ON THE PINON CANYON MANEUVER SITE, LAS ANIMAS COUNTY, COLORADO

by
Amy Nelson, Mona Charles, Randy Nathan, and Philip Duke

with contributions by
Daniel R. Bach
Cerisa Reynolds

Department of Anthropology,
Fort Lewis College, Durango, CO

Cooperative Agreement Number CA-6000-A9-003
Research administered by
Midwest Archeological Center, National Park Service, Lincoln, NE

Prepared for and funded by:
The Directorate of Environmental Compliance and Management, Fort Carson, CO

Fort Carson Cultural Resource Management Series Contribution Number 16

2007

REPORT DOCUMENTATION PAGE	*Form Approved* *OMB No. 0704-0188*

1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED *(From - To)*
2/10/2007	Final	July 2003 - September 2007

4. TITLE AND SUBTITLE
Archeological testing at Four Sites on the Pinon Canyon Maneuver Site, Las Animas County, Colorado

5a. CONTRACT NUMBER

5b. GRANT NUMBER
CA-6000-A9-003

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
Nelson, A., Charles, M., Nathan, R., Duke, P.

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Fort Lewis College, Department of Anthropology
1000 Rim Drive
Durango, CO 81301

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Midwest Archeological Center, National Park Service
100 Centennial Mall North, Room 474
Lincoln, NE 68508-3873

10. SPONSOR/MONITOR'S ACRONYM(S)
MWAC

11. SPONSOR/MONITOR'S REPORT NUMBER(S)
Fort Carson Contribution Number 16

12. DISTRIBUTION/AVAILABILITY STATEMENT
Available

DISTRIBUTION STATEMENT A
Approved for Public Release
Distribution Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT
In the summer of 2003, evaluative testing was undertaken at four sites in the Pinon Canyon Maneuver Site (PCMS) for the purpose of evaluating the potential for these sites to yield significant information about the prehistory of the PCMS and to better manage its cultural resources. The work was conducted under a cooperative agreement with the Midwest Archeological Center (MWAC), National Park Service. three sites are multicomponent historic and prehistoric and the fourth is prehistoric with a historic rock art inscription. Surface mapping, artifact analysis, and subsurface testing were implemented at each site. Archival research and geophysical surveys were conducted at two of the the historic sites. Information gathered from these investigations was used to make eligibility recommendations for the National Register of Historic Places (NRHP). One site, 5LA6108, is recommended as eligible for inclusion in the NRHP. The other three sites are recommended as not eligible. This report summarizes the results of the testing, which includes detailed information on each site's stratigraphy, material culture, features, and structures.

15. SUBJECT TERMS
Archaeology, History, Pinon Canyon, Colorado

16. SECURITY CLASSIFICATION OF: a. REPORT	b. ABSTRACT	c. THIS PAGE	17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON / 19b. TELEPHONE NUMBER *(Include area code)*
Unclassified	Unclassified	Unclassified	None	386	

FOREWORD

The archeological investigations reported in this manuscript are an important part of the Fort Carson Cultural Resources Management Program whose goal is to maintain the largest possible area for military training while protecting significant cultural and environmental resources. The current study is part of an integrated plan that takes a long-term systematic approach to meeting identification, evaluation, and resource protection requirements mandated by the National Historic Preservation Act. While meeting legislated requirements, this project also provides a valuable contribution to our knowledge of the prehistory and resources of Las Animas County, Colorado. Fort Lewis College completed the reported project in cooperation with Fort Carson.

Fort Carson began cultural resource studies on the Pinon Canyon Maneuver Site in 1983, immediately following the purchase of these lands. The Cultural Resources Program takes a multidisciplinary approach, combining archeological theory and historical methods with geological, geomorphological, botanical, and statistical techniques and procedures in order to focus its efforts to locate, evaluate, and protect significant cultural resources. Professional studies and consultations with Native American tribes have resulted in the identification of National Register of Historic Places (NRHP) eligible sites and districts. The cultural resources of Fort Carson and the Pinon Canyon Maneuver Site represent all major prehistoric and historic cultural periods recognized in the Great Plains and Rocky Mountains. Sites of the Paleoindian, Archaic, and Ceramic stages are present as are sites from the Fur Trade era, 19th century Hispanic and Euroamerican settlements, early 20th century homesteading and ranching, and World War II and Cold War era military sites. The project reported here completes the first phase of the archeological inventory program – identification and documentation of archeological sites to determine their NRHP eligibility.

The Cultural Resources Management Program is part of the Directorate of Environmental Compliance and Management (DECAM). This Directorate is tasked with maintaining Fort Carson's compliance with federal, state, and local environmental laws and mandates. The DECAM's holistic management philosophy holds that all resources are interrelated. Decisions affecting one resource will impact other resources. The decisions we make today will affect the condition of Department of Army lands and resources for future training, research, and recreation. Mission requirements, training resources, wildlife, range, soil, hydrology, air, and recreation influence cultural resources management decisions. Integrating compliance and resource protection concerns into a comprehensive planning process reduces the time and effort expended on the compliance process, minimizes conflicts between resource protection and use, allows flexibility in project design, minimizes costs, and maximizes resource protection.

Federal laws protect the resources on the Pinon Canyon Maneuver Site and Fort Carson. Theft and vandalism are federal crimes. Protective measures ensure that Army activity does not inadvertently impact significant cultural and paleontological sites. Fort

Carson does not give out site location information nor are sites developed for public visitation. Similar resources are located in the Picketwire Canyonlands where public visits can be arranged through the U.S. Forest Service, Comanche National Grasslands in La Junta, Colorado.

Fort Carson endeavors to make results of the resource investigations available to the public and scientific communities. Technical reports on cultural resources are on file at the Fort Carson Curation Facility (Building 2420) and the Colorado State Historic Preservation Office. They are also available through the National Technical Information Service, Springfield VA. Selected reports have been distributed to public libraries in Colorado. Three video programs produced by Fort Carson are periodically shown on Public Broadcasting Stations. Non-technical reports on the prehistory, history, and rock art of southeastern Colorado have been distributed to schools and libraries within the state. Fort Carson continues to demonstrate that military training and resource protection are mutually compatible goals.

Thomas L. Warren
Director, Directorate of Environmental
Compliance and Management
Fort Carson, Colorado
December 2006

POPULAR ABSTRACT

The archeological resources of the Pinon Canyon Maneuver Site (PCMS), located in Las Animas County, Colorado, have been intensely studied since the land was purchased by the Army in the 1980s. Before this, several important archeological sites in the near vicinity were identified and a few were excavated by professionals. Sites within and surrounding the PCMS have been inhabited since approximately 10,000 years ago. The earliest prehistoric natives lived off wild plants and game including now extinct megafauna, and were nomadic, after which they remained dependent on wild animals but incorporated more plant remains into their diet. The majority of the known archeological sites on the PCMS; however, date from the period known as the Late Prehistoric Stage. This Stage began about AD100 and ended around AD 1725. During that time, the prehistoric natives constructed houses made of hide, wood, and stone, and often settled in suitable rock shelters. This lifestyle changed dramatically in the 18th and 19th centuries when Anglo and Hispanic populations settled the area. The indigenous populations were removed from the land and forced onto reservations. The land where the PCMS is located was homesteaded by a few hardy Hispanic and Anglo people (several of the Anglo residents were recent European immigrants) who sought a living farming and ranching. By the late 1800s, economic and natural factors lead to the change from small homesteads to larger ranches. The American "Dust Bowl" in the 1930s caused many of these remaining people to sell their lands or to let the land go back to the government for back taxes. These actions resulted in a few landowners owning large parcels. In 1983, the U.S. Army acquired the PCMS area to use for military training. In 2003, four archaeological sites were tested by Fort Lewis College. The cultural landscape of the PCMS is better defined and our understanding of the past is enhanced through the study of these sites.

TECHNICAL ABSTRACT

In the summer of 2003, evaluative testing was undertaken at four sites. Three sites are multicomponent historic and prehistoric and the fourth is prehistoric with a historic rock inscription. The project's purpose was to evaluate the potential of each site to yield significant information about the prehistory and history of the Pinon Canyon Maneuver Site (PCMS). The work was conducted under a cooperative agreement between Fort Carson's Directorate of Environmental Compliance and Management (DECAM), the National Park Service, Midwest Archeological Center (MWAC) and Fort Lewis College (FLC). This project was prepared for and funded by DECAM, Fort Carson, Colorado. Archeological investigations included surface mapping, surface artifact collection, geophysical surveys and limited subsurface testing.

Site 5LA3333 is dominated by the ruins of an early 20th century homestead. The land was patented in 1922 by Harold Sater. The Sater family was part of the early homesteading era of southeastern Colorado. A less obvious prehistoric component consists solely of lithics and groundstone that probably date to the Late Archaic. Our subsurface investigations

yielded shallow cultural deposits; erosion and bioturbation had extensively damaged the integrity of both components.

Site 5LA4417 is comprised of prehistoric features and artifacts and one historic feature. Several ephemeral structures were visible. Two radiocarbon dates were obtained from this site. One sample from Feature 12, provides an intercept date of AD 1040 (940 ± 60 BP). A second radiocarbon sample with an intercept date of AD 1160 (910 ± 40 BP) was obtained from Feature 1. Sandstone boulders and juniper posts delineate a historic telephone line. Test unit excavations failed to demonstrate the presence of significant subsurface cultural deposits.

Site 5LA5612 consists of a large but sparse scatter of flaked lithics and bedrock metates primarily limited to the surface. Although several hearth features were noted when the site was originally recorded, our investigations did not produce evidence of these features. A radiocarbon sample with an intercept range from 760 BC to 550 BC (2480 ± 40 BP) and a second radiocarbon sample of AD 880 (1170 ± 40 BP) are from sequential layers in one test unit. The dates are on wood charcoal that we could not directly tie to artifacts, features or cultural horizons. A single historic surname was scratched into the sandstone outcropping.

Site 5LA6108 is dominated by the ruins of a large early 20th century homestead/ranch. The land was patented in 1922 by Henry Alfred Barnes. Several substantial architectural features suggest the full range of activities associated with historic ranching. A seasonal or temporary prehistoric habitation component was also tested and it produced buried artifacts, a hearth and a cultural horizon. An AMS radiocarbon date of AD 650 (1410 ± 40 BP) was obtained on charcoal from a hearth.

Surface mapping, artifact analysis and subsurface testing were implemented at each site. Archival research and geophysical surveys were conducted for the two historic homesteads. Information gathered from these investigations was used to make eligibility recommendations for the National Register of Historic Places (NRHP). One site, 5LA6108, is recommended as eligible for inclusion in the NRHP. The other three sites are recommended as not eligible. This conclusion is based on their limited information potential.

ACKNOWLEDGMENTS

Numerous individuals and organizations contributed to this report. Primary among these are the 2003 field crew members and supervisors. The project supervisor and principal investigator was Mona Charles. Christine Markussen and Randy Nathan shared the responsibilities of field director. Listed alphabetically the crew members included Melissa Baier, Ian Crosser, Derek Heersink, Nathan Hill, Cerisa Reynolds, and Joe Samulski. Sierra Geraci and Rosalind Sanford each spent a field session with us and Kep Heintz helped during the last field session. The crew members endured heat, wind, rain, cholla wrestling, red ants and other discomforts to make this project the best that it could be. Amy Nelson had multiple responsibilities serving as field and laboratory supervisor and field crew member. We are grateful to Thann Baker for assisting in setting up the field laboratory and operating the electrical resistance meter.

We thank the National Park Service, Midwest Archeological Center (MWAC) and the Fort Carson Directorate of Environmental Compliance and Management (DECAM) for the opportunity to conduct archeological work at the Pinon Canyon Maneuver Site. We graciously acknowledge Steven DeVore from MWAC for his guidance and support throughout. In particular we thank Steve for sharing his knowledge of geophysical surveying.

We wish to express our appreciation to Randy Korgel of the DECAM Cultural Resources Management Program for his support and advice, which greatly enhanced the content of this report. Other members of the Program that aided in this project included Mike Chidley, Pam Cowen, Thad Swan, and Kelly Wright. Cowen and Wright provided us with archival data that we needed to complete the report. Pam Cowen aided with the catalog system.

Our thanks go to Patricia Holm for the artifact photographs, artifact cataloging, database input, and computer technical support. Ian Crosser and Cerisa Reynolds were invaluable to the completion of the laboratory work at Fort Lewis College. Haley Harms designed the artifact database and once again her assistance is greatly appreciated. Danielle Sheptow greatly aided in the final report editing and artifact compilation. The staff at the PCMS cantonment facilitated our comings and goings and we are thankful to them for helping us along the way.

We shared accommodations with New Mexico State University (NMSU) staff at the Red Rocks Ranch. We appreciate them sharing their space and their knowledge with us. We especially acknowledge Mark Owens for sharing his insights into Pinon Canyon archaeology and particularly his knowledge of lithic technology. This project and our crew greatly benefitted from his expertise in both areas. We thank Mead Klavetter, PCMS wildlife biologist of the Red Rocks Ranch, for helping with just about everything, not the least of which were small-scale crises.

TABLE OF CONTENTS

LIST OF FIGURES

List of Tables

CHAPTER 1
INTRODUCTION

Introduction

Fort Lewis College (FLC) entered into a cooperative agreement (Modification 8 to Cooperative Agreement CA6000-A-9003 CA-6000-A9-003) with the National Park Service, Midwest Archeological Center (MWAC) to conduct evaluative testing at four archeological sites on the Pinon Canyon Maneuver Site (PCMS) in Las Animas County, Colorado (Figure 1.1). Field work for the project was conducted over four field sessions from July 1 through August 21, 2003 with students and staff from FLC. Mona Charles served as project director. Work undertaken at these sites consisted of surface artifact inventory, feature inventory, recordation, surface artifact collection, surface mapping, geophysical surveys and limited subsurface testing. The purpose of these investigations was to define more precisely the site boundaries and to determine whether the sites were potentially eligible for inclusion in the National Register of Historic Places (NRHP). Colorado Cultural Resource Survey Forms were updated and supplementary DECAM and FLC forms were completed for all sites. For sites determined as having the potential to be included in the NRHP, recommendations are made for their protection. If it is determined that protection is not feasible, recommendations are made for data recovery. These include which areas should be of most concern, what methodology should be used, and justification for the recommended methodology.

The four sites included in this cooperative agreement are: 5LA3333, 5LA4417, 5LA5612, and 5LA6108. Sites 5LA3333 and 5LA6108 are predominately historic sites that are associated with ranching and farming. Both, however, possess prehistoric components. The prehistoric component at 5LA6108 was not previously recorded. This component was recorded and added to the updated site forms for the site. The other two sites (5LA4417 and 5LA5612) are prehistoric sites but possess minor historic components.

The intent of site testing was to determine horizontal and vertical site boundaries, and to determine whether each resource satisfied the criteria for a significant archeological resource as outlined in the previously developed historic context for the Arkansas River Basin in southeastern Colorado (Zier and Kalasz 1999) and in the current research design for the PCMS (Andrefsky and Zier 1988). Specifically, determination of the prehistoric site components to contribute significant knowledge to the prehistory of the PCMS was predicated on the following criteria: Population Dynamics; Technology; Settlement and Subsistence Strategies; and Geomorphology and Paleoclimates. The historical components of each site were evaluated through the following historical research concerns: Chronology; Functional(site type); Settlement; Culture Change; and Ethnicity.

The field season consisted of four ten-day sessions with a crew size between eight and thirteen. Field work was conducted in accordance with the existing guidelines and procedures established for the PCMS (Dean 1992) and those of the Colorado Historical

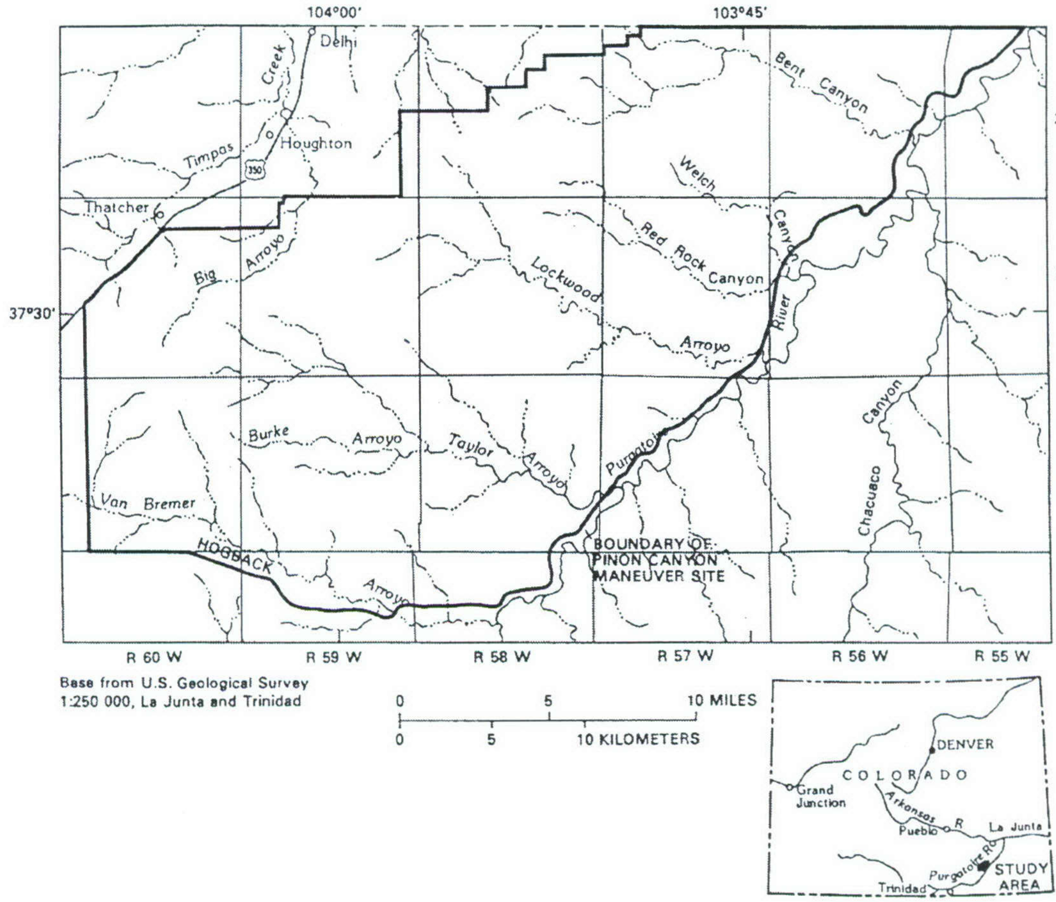


Figure 1.1. Locational map, Pinon Canyon Maneuver Site, Las Animas County, Colorado.

Society (CHS), State of Colorado Office of Archaeology and Historic Preservation (OAHP). The extent of subsurface testing was reviewed by MWAC personnel. This testing did not exceed the necessary requirements to determine site significance. Laboratory procedures followed those of Dean (1992) involving analysis of collected materials, while cataloging and curation followed those provided by DECAM to FLC (Pamela Cowen, personal communication 2003). Report standards followed those of the OAHP, the Directorate of Environmental Compliance and Management (DECAM) and MWAC.

Field techniques employed at the site depended on the goals of the research design. Each site was mapped in its entirety. Surface collection of artifacts was carried out on sites, but with restrictions on the types of artifacts collected especially from the historic components. Geophysical prospecting with a gradiometer and a resistance meter were conducted at two sites, 5LA3333 and 5LA6108.

The results of testing at 5LA3333 demonstrated that limited undisturbed historic and prehistoric cultural materials are present at this location, but their potential to yield significant information to the area's history is doubtful. The stratigraphy suggests that this site has been subject to fairly extensive bioturbation and slopewash activities. Prehistoric and historic artifacts recovered from the shovel tests and test units are sparse. The prehistoric artifacts were not associated with features or a buried paleosol, suggesting a lack of contextual integrity. Also, evidence from these excavations indicates that prehistoric artifacts on this site may be deep enough to avoid being impacted by military activity. The site is not recommended as eligible for inclusion in the NRHP and further work is not recommended.

Testing at 5LA4417 demonstrated that sediments were shallow over all of the areas tested and artifacts recovered from excavation were minimal. The lack of substantial subsurface deposits above bedrock indicate a lack of potential for integrity and/or additional research. The level of testing conducted at this site is believed to be sufficient to determine that the site does not hold the potential to yield additional information significant to prehistory. Therefore, this site is not recommended as eligible for inclusion in the NRHP, and no further work is recommended.

Overall, shallow sediments extend over the majority of 5LA5612, although sediments in the drainage area are deep. The hearths recorded in 1983 were not relocated. Soil from test units ranged from brown to grayish brown to very dark grayish brown and resemble ashy deposits but are likely from the organic material abundant along this drainage. Erosion throughout the drainage may account for additional loss of cultural materials. Cultural deposits that were located 40 - 50 cm below the surface will likely not be impacted by military activity. These deeper artifacts could have been deposited through bioturbation or through erosion. Although testing was limited here, no paleosol or features were found with the deeply buried artifacts. The surface remains no longer hold significant archaeological potential, if they ever did. The site is not recommended as eligible for inclusion in the NRHP. No further work is recommended.

At the completion of field and laboratory work, only one site, 5LA6108, was considered potentially eligible for inclusion in the NRHP. The significance of the site is defined by Criterion D [36 CFR 60.6] of Section 106 of the National Historic Preservation Act of 1966: the site has yielded, or may be likely to yield, information important in prehistory or history. The presence of stratified cultural deposits in both historic and prehistoric contexts and extending more than one meter below the ground surface strengthens the integrity of the site despite some minor disturbances; the result of military maneuvers. It is recommended that certain areas of the site be protected and preserved. These areas are identified and discussed in the text of this report.

Recommendations for further work include the adjustments to the site boundary as well as placement of a protective fence. This recommendation is based on the depth of cultural deposits and/or the extent of surface artifacts in specific areas of the site. It is recommended that portions of the site be fenced, which should protect those areas from future impacts. Further data retrieval is not recommended at the site if avoidance and protection are implemented.

The public interest was well served by the participation of FLC students in this work. Students gained valuable practical experience in all facets of archeological research, and thus this project materially contributed to the educational mission of FLC. The resulting addition to the body of archeological knowledge of this part of the state benefitted the public in that it has helped preserve valuable cultural resources and has increased awareness of the rich prehistoric and historic cultural legacy of the nation in general.

This report documents the findings of this evaluative work through eleven chapters and five appendices. Chapter 1, the Introduction, provides a general overview of the site and the project. Chapters 2 and 3 describe the natural and cultural settings of the PCMS and place this present work into its management context. Chapter 4 presents the research design and objectives. Chapter 5 describes the field and laboratory methods used for this project. This chapter is general in scope and deviations from the general methodologies described in Chapter 5 are defined in the individual chapters that follow. Chapters 6 through 9 detail the investigations conducted at each site. Each chapter is independent, with descriptive results from the surface and subsurface investigations and artifact and special sample analyses from each site. Chapter 10 provides a brief summary and management recommendations. A References Cited section concludes the report. Appendices I through VI provide specific data on faunal remains, macrobotanical remains, radiocarbon, soil analysis, shovel test stratigraphy and flaked tools.

CHAPTER 2
BACKGROUND TO THE STUDY: THE NATURAL AND CULTURAL ENVIRONMENTS

Introduction

The Pinon Canyon Maneuver Site is located in the plains of southeastern Colorado, just north of the boundary between the Great Plains proper and the Sonoran zone of the Desert Southwest. The purpose of this chapter is to describe the natural and cultural environments of the maneuver area, so that human adaptations, both prehistoric and historic, can be better understood. The first section provides the reader with a synopsis of the Great Plains in general. The next section deals specifically with the natural environment of the PCMS. The final two sections describe the history and prehistory of the PCMS.

The Great Plains of North America

Walter Prescott Webb (1931) described the Great Plains as a land of sun, wind, and grass. Covering an area of approximately 450,000 square miles, the Plains stretch from the Rocky Mountains in the west to Iowa and Missouri in the east, from southern Canada in the north to Texas in the south (Wedel 1961).

Physiography

Much of the following synopsis is taken from Wedel (1961). The Plains have low relief. Their elevation ranges from a high of 2134 m (7,000 ft) in Wyoming and 1524 m (5,000 ft) in the Colorado foothills to about 610 m (2,000 ft) in the eastern boundary. Geologically, the Plains are the result of repeated uplifts of the Rockies which started during the Tertiary Period (65 my BP) and extended into the Pleistocene Epoch (2 my BP). As the western land increased in elevation, its streams became increasingly active and huge quantities of silt were deposited to the east. This occurred in southern Canada, most of North and South Dakota, Wyoming, Montana, as far east as most of Nebraska and Kansas, to central Oklahoma and central Texas. Streams are easterly flowing. Most water sources are permanent springs and seeps from underground reservoirs. The largest of these is the Ogalalla Formation. There are numerous sand dunes on the Plains, the largest of which are located in central Nebraska north of the Platte River.

Climate

Wind systems are dominated by westerlies. In the central and southern plains, "hot winds" can blow at temperatures over 100^0 F. In the winter, the southerly movement of the jet stream brings with it the cold Arctic air-mass to move south, creating cold temperatures. Upper temperature readings decrease and lower readings increase from south to north. Annual temperature means vary from 65^0 F in Texas to 35^0 F in Canada. Extreme summer highs of 110^0 F are found, however, in both Texas and southeast Alberta. Minimums of -16^0 F in Texas and -55^0 F in Canada are recorded.

Average annual precipitation on the plains has a high of 102 cm (40 in) in southeast Kansas, with lows of 35 cm (14 in) in eastern Colorado and New Mexico, and 25 cm (10 in) in southeast Alberta and southwest Saskatchewan. There is much local variation due to elevation. For example, the Black Hills of South Dakota have 15 cm (6 in) to 20 cm (8 in) more precipitation per year than surrounding areas. Summer precipitation comes mostly in the form of heavy late afternoon thunderstorms which creates puddling so that most moisture is lost through transevaporation before it can seep into the soil. In the winter, especially in the central and northern plains, heavy winter snowstorms are common.

This climate severely restricts the ability to grow crops. The number of frost-free days in the southern and central plains tend to range between 140-200, whereas in the northern plains, the number drops to below 100. The problem with growing crops is that drought increases as one goes south, cold increases as one goes north.

Flora and Fauna

The dominant grassland biome characteristic of the plains is created by the combination of high evaporation from the constant winds and low precipitation. Fire (both natural and human-caused) also was a factor, as was the action of ungulate grazing, the importance of these are debated still (Arthur 1975).

Two major grass types exist on the plains: short grasses and tall grasses. Short grasses are characterized by short stems and roots, and quick growth with little moisture. They hold their nutritional content through the dormant winter period and therefore provide good winter forage. The tall grasses have long stems and roots. They are found in areas of higher precipitation such as along foothills and the eastern margins.

The dominant fauna of the plains was the American bison (Bison bison bison), until massive EuroAmerican settlement in the 19th century drove the animal almost to extinction. It provided aboriginal groups with food, materials for clothing, utensils, glue, bindings, and tipi covers. Although their migratory behavior was formerly denied (Roe 1951), it is now fairly widely accepted that herds engaged in small-scale, localized migrations (McHugh 1958). Other animals native to the Plains included the antelope, deer, wolf, kit-fox, jackrabbit, Plains grizzly, various birds, fish in the major rivers, and shellfish (primarily mussel).

Paleoenvironments

Two models for paleoenvironments in North America are available. The first, proposed by Antevs (1955), envisages climatic change as slow and gradual. Consequently, he defined only three major climatic episodes for the Holocene (or Neothermal, in his climatic classiciation system): (1) Anathermal (10,150-7,000); (2) Hypsithermal (7,000-4,500); and (3) Medithermal (4,500-present).

This model was replaced by one based on the European Blytt-Sernander model of

short periods of climatic stability interrupted by rapid change to new stable states (Wendland and Bryson 1974): (1) Late Glacial 13,000-10,500 BP; (2) Boreal 10,500-9,500 BP; (3) Atlantic 9,500-5,000 BP; (4) Sub-boreal 5,000-3,500 BP; (5) Sub-Atlantic 3,500 BP-AD 400; Scandic AD 400-900; (6) Neo-Atlantic AD 900-1200; (7) Pacific I AD 1200-450; (8) Pacific II AD 1450-1550; (9) Neoboreal (Little Ice Age) AD 1550-1850; and (10) Recent AD 1850-present. There is, however, much regional variation in the dating and severity of these episodes, because of their transgressive nature (Wilson 1988), and, therefore, local studies are necessary for any intensive study of human-environment relationships.

The Natural Environment of the Pinon Canyon Maneuver Site

Physiography

The PCMS comprises approximately 93,381 hectares (243,000 acres or 380 square miles) of rugged country in Las Animas County, southeastern Colorado. It is located at the edge of the plains grasslands, and is close to two other major physiographic regions: the Rocky Mountains, specifically the Sangre de Cristo Range to the west and the Raton Mesa uplift to the south; and the American Desert Southwest (Weber 1988:XVII-2). The PCMS is comprised of four physiographic zones: plains, upland mesas, arroyos and canyons, and basaltic outcrop called the Hogback.

Geology and Geomorphology

A generalized description of the geology and geologic structures from the PCMS is extracted from several major sources. These sources include the geologic and structure contour map of the La Junta Quadrangle (Scott 1968) and the geologic map of the Trinidad Quadrangle (Johnson 1969). Detailed information on the local geology was obtained from two principal sources, a report of the hydrology of the PCMS by the U.S. Geological Survey (von Guerard et al. 1987) and the geomorpohological and geoarcheological investigations of the PCMS (Schuldenrein 1985). These documents were of value for their descriptions of the local geophysical environment. Two maps and one table were selected from these reports to include in the following discussion.

Lithology A generalized chart of the geologic stratigraphy is presented in Table 2.1. The oldest formations identified in the PCMS are of Permian, Triassic, and Jurassic ages, and they are exposed only in the deeply dissected canyons and along the Purgatoire River Valley. These rocks consist of sandstones of the Entrada Formation, an ancient dune deposit, limestones and claystone of the Ralston Creek Formation and the vari-colored claystones and limestones of the Morrison Formation. The Morrison Formation is Jurassic in age and was deposited on an expansive floodplain that was built up by streams carrying clastic sediments off the mountains to the west during the Nevadan orogeny.

Table 2.1. Generalized geologic chart for the PCMS. Taken from von Guerard, et al. 1987:11.

System	Series	Formation	Member	Approximate thickness (m)	Physical Description
Quaternary	Holocene	Alluvium		Variable	Gray, poorly sorted stony sand and silt forming flood plain
Tertiary	Pleistocene	Dune sand		Variable	Yellow, fine-grained sand, forming localized dunes
	Oligocene and Eocene	Basic plugs, dikes, and sills			Dark gray, finely crystalline, olivine, basalt dikes
Cretaceous	Upper Cretaceous	Niobrara	Smoky Hill Shale Member	Variable	Yellowish-gray, fossiliferous, calcareous shale and silty limestone
			Fort Hays Limestone Member	15 - 18	Beds of chalk .15 to 1 m thick separated by beds of dark-gray chalky shale 2.5 to 52 cm thick
		Carlile Shale	Codell Sandstone Member	1.5 - 7	Upper part is thin lenses of dark limestone interbedded with a limey shale. Basal .75 to 1 m is a dense, near-black, fossiliferous limestone
			Blue Hill Shale Member	20 - 25	Dark fissile shale with large calcareous concretions
			Fairport Chalk Member		Tan to black, chalky, calcerous shale
		Greenhorn Limestone	Bridge Creek Limestone Member	9 - 12	Interbedded, fossiliferous limestone and limey shale
			Hartland Shale Member	7 - 9	Light gray limey shale with thin beds of Bentonite
			Lincoln Limestone Member	4.5 - 9	Limey shale with platy limestone beds near base and top
		Graneros Shale		27 - 45.5	Dark gray to black, fissile, noncalcareous shale, with two beds of dense, dark limestone
	Lower Cretaceous	Dakota Sandstone		22.5 - 42.5	Yellowish brown, crossbedded cliff-forming sandstone
		Purgatoire Formation	Kiowa Shale Member	12 - 21	Fossiliferous, marine, dark-gray, claystone, siltstone and sandstone
			Cheyenne Sandstone Member	21 - 33.5	Massive white to yellowish brown, crossbedded sandstone
Jurassic	Upper Jurassic	Morrison Sandstone		30.5 - 91.5	Vari-colored claystone, brown weathering sandstone and gray sandstone
		Ralston Creek Formation		6 - 15	Greenish gray claystone, gray limestone with jasper and agate
		Entrada Sandstone		6 - 30	Massive, white crossbedded sandstone
Triassic and Permian		Undivided			Mostly reddish brown sandstone and shale with dolomite and limestone

The most prominent lithologies in the PCMS, however, are Cretaceous in age and consist of sandstones and limestones embedded with shales. The Lower Cretaceous Purgatoire and Dakota Sandstone outcrops over a large portion of the PCMS. The Purgatoire Formation consists of two members - Cheyenne Sandstone and Kiowa Shale. Cheyenne Sandstone is a white to yellowish brown, cross-bedded, massive sandstone. It ranges from 12 m (40 ft) to 21 m (70 ft) thick. It is exposed as white cliffs along the Purgatoire River. It is distinguished from the Dakota Sandstone by its whiter color and more rounded weathered form. The Kiowa Shale is a fossiliferous, marine, dark-gray claystone. This is locally exposed in the deeper reaches of the Purgatoire River Canyon.

The Purgatoire Formation is overlain by the Dakota Sandstone. This sandstone is a yellowish brown, cross-bedded sandstone that has weathered into steep ledges and cliffs that form the rim of the Prugatoire River canyon and many of the other canyon rims (von Guerard et al., 1987:9). Surface exposures are often coated with manganese oxides or desert varnish. The Dakota Sandstone was formed by a major transgression of the Cretaceous seas. It is a beach facies and often contains hard, dark-brown ironstones. Some exposures also contain chert and chalcedony pebbles. The formation ranges between 23 m (75 ft) and 43 (140 ft) thick. In particular, the Dakota Sandstone outcrops along most of the canyon rims and underlies the shallow soils over most of the PCMS. This formation along with the desert varnish which has formed on the surface provides the canvas for most of the extensive rock art found in the PCMS.

Overlying the Dakota Sandstone and Purgatoire Formations and comprising the major rock of the western and northern sections of the PCMS are the light to dark gray noncalcareous shales and fossiliferous limestones of the Upper Cretaceous. These include the Carlile Shale, Greenhorn Limestone and Graneros Shale. These formations were deposited during a major transgression of the Cretaceous seas about 100 million years ago. These formations consist of several members (Table 2.1). These sediments were laid down in deeper waters as the Cretaceous seas continued to advance north and east across the continent. The Late Cretaceous Niobrara Formation outcrops along the highest ridges in the northwestern part of the PCMS. Comprised of two members, the formation consists of beds of chalk separated by beds of dark-gray chalky shale and overlying yellow-gray, fossiliferous calcareous shale, and silty limestone.

The most recent lithology in the PCMS are two eastward trending dikes. The larger of the two is the Hogback. The Hogback is located at the extreme southeastern boundary of the PCMS. A smaller dike is located west of the Hogback. Both dikes are composed of dense, dark, olivine basalt (Scott 1968).

Geomorphology The PCMS is divided into four major landscape units: Hills, Steppes, Hogback, and Arroyo/Canyon (Schuldenrein 1985). The Hills landscape unit includes the Black Hills, the Big Arroyo Hills, and the Bear Spring Hills. This landscape unit contains more varied terrain than any other unit because it consists of steep slopes, pediments

and heavily dissected hill slopes. The Steppe landscape unit is level to slightly sloping grasslands with mixed pinyon and juniper forest that covers most of the PCMS. The Hogback landscape unit, a basaltic dike, is bounded by the Van Bremer Arroyo and its tributaries and is shaped by erosional activity on a steeply tilted cuesta. The Arroyo/Canyons landscape unit includes the slopes and bottoms of the major drainages in the PCMS.

The above landscape units are subdivided further into eight landform categories (Schuldenrein 1985:70). These categories include:

* heavily eroded, stripped steppes, and very steep slopes
* broad steppes
* graded pediments or gently sloping steppes
* alluvial fills and terraces
* the Hogback and its steep slopes
* the loessic plains at the western edge of the PCMS
* the sandy terrains below the Big Arroyo Hills
* escarpments and cliffs

Bedrock Structure The prevalent structural pattern for the region as a whole and including the PCMS is the gently dipping, subhorizontal sedimentary bedrock pitch at the western edge of an east - west trending axis. Exceptions to this major structural feature in the PCMS include the Black Hills double monocline and the Hogback dike.

Hydrology The PCMS is drained principally by the Purgatoire River, which flows along the eastern edge of the maneuver area. Five main arroyo systems and numerous smaller systems are present in the PCMS. The six major systems from south to north are Van Bremer, Taylor, Lockwood, Red Rock, Welsh, and Bent Canyons. Like most drainage patterns, the local pattern is directly tied to the underlying bedrock structure. The fracture or joint lineaments, of which there are two major lineaments, are oriented north to northwest. The fracture joints have important implications to archeology because they are sources of groundwater entrapment, springs, and rock shelters.

Soils There is limited soil development across the PCMS - the product of prevelant long-term aridity. Two major soil orders are present in the PCMS. These are the loessic Entisols in the dunal area east of Simpson along the western edge, and the Aridisols which cover most all of the PCMS. Both soil orders possess weak A soil horizons and clay enriched B horizons. Two aridisols occur in the project area and are mapped by the United States Soil Conservation Service (U.S.C.S 1983). The later soil type is typically found on the shale bedrock toward the northern end of the PCMS. This soil profile is a shallow, weak A horizon with little organic matter overlying even weaker B horizon. These soils are usually as old as the alluvial fills of the arroyo. They may represent most of the Upper Quaternary. A second soil association, Travessilla-Wiley-Villagreen, is formed over sandstone bedrock and covers most of the project area. Based on soil development, geomorphologic position

and radiocarbon dating, the PCMS experienced periods of eolian deposition in the late Pleistocene and Altithermal, and at least four periods of alluvial deposition, one pre-9,080 BC. and three thereafter (McFaul and Reider 1988a: III-20).

Climate

The climate at the PCMS is classified as a cold, middle latitude, steppe climate (McFaul and Reider 1988b: II-3). January is the coldest month, with an average of -1.4^{0}C at Rocky Ford, 75 km to the northeast (McFaul and Reider 1988b: II-3). Winter temperatures are ameliorated by sporadic winter chinooks. Precipitation averages 292 mm at Rocky Ford, with May being the wettest month (McFaul and Reider 1988b: II-3).

Flora and Fauna

Approximately 350 plant species are identified in the PCMS. These are organized into four grassland communities, 16 shrubland communities and six woodland communities (Van Ness and Kalasz 1988: II-14). These provide a very wide range of resources both for consumption and other purposes (Van Ness and Kalasz 1988: II-30-41). A similarly wide variety of fauna have been identified in the PCMS. Large ungulates include mule deer and pronghorn antelope. North American bison once roamed the area.

The Cultural Setting

The purpose of this section is to place the FLC work in its research and management perspective. However, it is not intended to serve as a redundant reworking of the comprehensive syntheses of PCMS archeology that have been produced earlier (Andresfky 1990). Readers are encouraged to refer to these syntheses, which are noted below, for detailed information on the archeology of the PCMS, as well as to Athearn's (1985) excellent historical review of southeastern Colorado.

Plains Archaeology

The archeology of the PCMS, for obvious reasons, cannot be separated from Plains archeology. Historical overviews of the development of the latter are found in Frison (1973), Wedel (1983) and Duke and Wilson (1995a). The following section draws heavily from these three works, as well as from others that are referenced as appropriate.

Plains archeology was a relatively late entry into American anthropology, probably for two reasons. First, it lacked the monumental structures which had attracted early students to places like the Southwest. Secondly, influential early anthropologists, from Wissler to Kroeber, had declared the region uninhabitable prior to the acquisition of the horse (Frison 1973:151).

Throughout the 1920s, some archeologists began working in the Plains. However, there was no systematic investigation or excavation, and some strange theories prevailed, for example the Welsh influence among the Mandan of the Middle Missouri region (Frison

1973). This perspective changed as a result of the number of early human finds located in the area which put Plains archeology in the forefront of this study in the 1930s. Sites like Lindenmeier and Dent in Colorado, together with Clovis and Folsom in New Mexico were discovered in this decade. Also, during this decade, theoretical contributions from Strong and Wedel and Krieger helped Plains archeology gain a national stature (Duke and Wilson 1995a:3). Plains archeology, for a while, became a "high-status" area of study. The second boost to Plains archeology came as a result of the possible loss of thousands of archeological sites in the Missouri River floodplain through reservoir construction for recreation, storage, and hydro-electric facilities. Plains archeology became for a critical part of its life dominated by salvage archeology concerns (Frison 1973).

Government involvement in Plains archeology received a further boost in the 1960s with the modern era of cultural resource management. However, because large portions of the Plains are privately owned and therefore not under the jurisdiction of federal conservation laws, the importance of archeological studies of huge areas like the PCMS take on additional importance.

It is true to say that Plains archeology has been dominated by the practical necessities of dating sites and erecting spatio-temporal frameworks (Duke and Wilson 1995a). Despite the early important theoretical contributions of Plains archeologists like William Duncan Strong (1935) and Waldo Wedel (1936), Plains archeology has never flirted with archeological theory for its own sake. Nevertheless, elements of processualism have become important mainstays of much contemporary Plains archeology, whether it be Ahler (1970), Calabrese (1972), Johnson (1988), Bamforth (1988) or Kelly and Todd (1988). Even postprocessual studies have made their way onto the Plains (Duke and Wilson 1995b). Nevertheless, these studies all seem to have been driven by the primary need to understand the prehistory of the Plains, rather than using the Plains merely as a testing ground for proposed theoretical contributions to the discipline at large.

Southeastern Colorado Archaeology

The purpose of this section is not to repeat the well documented syntheses provided by Anderson (1988), Cassells (1983), Eighmy (1984) and Zier and Kalasz (1999) for southeastern Colorado. However, it is necessary to "set the scene" as it were, so that the specific resources discussed and evaluated in this report may be better understood.

The cultural taxonomies and classifications used in southeastern Colorado are an implicit amalgamation of taxonomic systems proposed by McKern (1939) and Willey and Phillips (1958). Thus, we note the interchangability of McKern's "focus" and Willey and Phillips's "phase" concepts throughout much Plains archeological writing (see also Chomko et al. 1990:9). The terms stage and period have also become virtually synonymous. This is particularly apparent in discussion of the Archaic, a confusion that has been fueled by the use of the term "Archaic" by Frison (1978) for the Middle Prehistoric Period. While this interchange is acceptable for Wyoming, where the Altithermal of the early Middle Prehistoric

Period created the need for Archaic-stage adaptations, it is less applicable elsewhere in the northern Plains, where a commitment to large animal hunting may have continued unabated, despite the stress caused by Altithermal climatic deterioration.

It is fair to say that understanding the processes behind the patterns that constitute the culture-historical sequences of southeastern Colorado are still essentially unknown. For example, although lengthy discussions on the (dis)similarities between projectile points and other diagnostic materials have been made by numerous workers (e.g. Gunnerson 1987), there has been less discussion on whether these patterns are the result of migration, diffusion or other cultural factors. Point styles seem to constitute distinct horizon styles that cross-cut other cultural boundaries, and it is clear that an adequate understanding of the area's prehistory cannot be completed until these factors have been evaluated.

The PCMS is part of the southeast Colorado cultural unit as defined by Eighmy (1984) and more recently defined as part of the Arkansas River Basin (Zier and Kalasz 1999). Eighmy (1984:10) divides the chronology of this unit into four periods; Paleoindian, Archaic, Ceramic, and Protohistoric/Historic. In previous reports of our work at the PCMS (Charles et al. 1996), we used Eighmy (1984) and Lintz and Anderson (1989) as our primary organizational frameworks. However, we are persuaded by Zier and Kalasz's (1999:69) recent reworking of Eighmy's basic schema based on new data and a clarification of the criteria used to distinguish between different taxa (Table 2.2.). Their reworking retains the Paleoindian and Archaic terms as stages, and replaces the Ceramic period with the Late Prehistoric stage. The Protohistoric period is dated to AD 1450-1725 (500-225 BP). In the following synthesis we use the dates for these stages and periods as suggested by Zier and Kalasz (1999:69).

Paleoindian Stage The Paleoindian stage, which dates from approximately 11,500 BP to 7800 BP, is a well-documented phenomenon on the Colorado Plains, the area producing many significant finds. The Paleoindian stage straddles the transition from terminal Pleistocene to early Holocene environments with an accompanying change in fauna and flora. It is typified by nomadic hunters and gatherers concentrating on the killing of large fauna, such as mammoth and now-extinct forms of bison. The Paleoindian stage is divided into the Pre-Clovis (>11,500 BP), Clovis (11,500-10,950 BP), the Folsom (10,950-10,250 BP); and the Plano (10,250-7800 BP) periods. Although both Clovis and Folsom periods are identified by distinctive fluted points, the processes of transition between the two are unclear, and Frison et al. (1991) have proposed a transitional Goshen complex. The Plano period is characterized by a proliferation of point types, which may reflect increased territoriality and technological specialization as greater resource stability preempted the need for long-distance interaction networks (Hayden 1982:119).

The presence of humans in southern Colorado and surrounding areas during the Paleoindian stage is represented primarily by surface finds; for example, there are two Folsom finds on the Chaquaqua Plateau (Campbell 1976). This area is close to the Folsom type-site, located just southeast of Raton, New Mexico. Within 200 miles of FCMR are the

Table 2.2. Cultural taxon and temporal ranges for southeastern Colorado. Defined by Zier and Kalasz (1999).

Cultural Taxon	Temporal Range
Paleoindian Stage	>11,500 - 7800 BP
Pre-Clovis Period	>11,500 BP
Clovis Period	11,500 - 10,950 BP
Folsom Period	10,950 - 10,250 BP
Archaic Stage	7800 - 1850 BP
Early Archaic Period	7800 - 5000 BP
Middle Archaic Period	5000 - 3000 BP
Late Archaic Period	3000 - 1850 BP
Late Prehistoric Stage	1850 - 225 BP
Developmental Period	1850 - 900 BP
Diversification Period	900 - 500 BP
Apishapa Phase	900 - 500 BP
Sopris Phase	900 - 750 BP
Protohistoric Period	500 - 225 BP

well-known Paleoindian sites of Cattleguard, Lindenmeier, and Jurgens. The bison-kill site of Olsen-Chubbuck (Wheat 1972) is also relatively close, and it is likely that more Paleoindian sites will be found in the future.

The Paleoindian stage is manifested on the PCMS by isolated Folsom and Plano materials (Ahler 2002; Andrefsy and Zier 1988: VIII-3). At the Barnes Site, 5LA9187, two pieces of a broken Folsom point were recovered from the surface during an archeological survey. Subsequent testing and geoarcheological trenching failed to identify a buried Paleoindian component. A broken Folsom point was apparently collected from 5LA3421 during an earlier testing phase (Kuehn 2002). Several Plano projectile points have been recovered from the PCMS (Lintz and Anderson 1989; Zier and Kalasz 1999; Owens et al. 2000, 2004), but all are surface finds with little potential for *in situ* deposits. The scarcity of Paleoindian sites is a reflection not only of low population densities at this time, but also of local geomorphological processes that have tended to obscure or erode early Holocene deposits.

Archaic Stage The Archaic stage begins about 7800 BP in southeastern Colorado, and, as a whole, sites attributed to this stage are well represented. It is characterized by a shift to a wider subsistence spectrum of hunting and gathering, an increase in the use of ground stone tools in plant preparation, and, at its end at least, greater sedentism, which may coincide with the introduction of cultigens. It is divided into three periods: Early,

Middle, and Late.

Early Archaic period (7800-5000 BP) sites are relatively rare in southeastern Colorado (Eighmy 1984:68; Zier and Kalasz 1999:100). Indeed it is possible that during this period, which coincides with the Altithermal warming episode, the Plains were abandoned or minimally occupied by humans (Reeves 1973; Benedict and Olson 1978; Buchner 1979). Several Early to Middle Archaic points have been located on the PCMS (Lintz and Anderson 1989; Andrefsky 1990; Andresfky and Zier 1988; Owens et al. 2000). The Middle Archaic period (5000-3000 BP) is well represented by both radiocarbon and typologically dated components in southern Colorado (Eighmy 1984). Point types bear a resemblance to Southern Plains and Southwest types (including the Picosa Culture). A tested site on the PCMS (5LA5258) yielded an Early or Middle Archaic projectile point. Unfortunately, this site did not produce any radiocarbon dates to confirm or reject this temporal association (Andrefsky et al. 1990). Other findings of Middle Archaic points include those from Welsh Canyon (Loendorf and Loendorf 1999) and the Black Hills (Owens et. al. 2000). Archeological evidence for the Late Archaic period (3000-1850 BP) in southerneastern Colorado is provided by a series of sites—including stratified rock shelters—such as Carrizo, McEndree Ranch, Medina, Recon John, and Trinchera. The last site provided not only stratigraphic sequences, but also organic material and bones that indicate an emphasis on small-game hunting (Wood-Simpson 1976:177). Archaic sites in southern Colorado are sufficiently numerous to allow the reconstruction of settlement systems: see, for example, Alexander and Babcock's (1982) study of the archeology of the FCMR, Lutz and Hunt's (1979) study of the Purgatoire and Apishapa highlands, and Eddy et al.'s (1982; 1984) study of the John Martin Reservoir. Late Archaic points, although never common, have been recovered from the PCMS during survey (Andrefsky et. al. 1990; Loendorf and Loendorf 1999; Owens et. al. 2000). There is a consistent pattern in increased numbers of projectile points through the Archaic on the PCMS, which presumably reflects population trends.

Late Prehistoric Stage The Late Prehistoric stage (Zier and Kalasz 1999) is used to represent the last two thousand years of aboriginal occupation of the study area. The major technological innovations are: ceramics, the bow and arrow, an increase in stone-built architecture and the appearance of small quantities of cultivated plants, in particular maize. This stage corresponds to Eighmy's (1984) Ceramic period. Eighmy divided the Ceramic period into Early and Middle subperiods while Gunnerson (1987:97) and Zier et al. (1987:2-13) added a Late subperiod, which corresponds to Eighmy's Protohistoric period. Like Gunnerson (1987) and Eighmy (1984), Zier and Kalasz (1999) divide the stage into three periods but Late Prehistoric Stage for the Ceramic Period. The Developmental period dates from 1850-900 BP, and corresponds essentially to Eighmy's Early Ceramic period (Zier and Kalasz 1999:160). The Diversification period (900-500 BP) is divided into the Apishapa and Sopris phases, which correspond to Eighmy's Middle Ceramic period (Zier and Kalasz 1999:189). The Protohistoric period is dated to 500-225 BP and correlates with the abandonment of Apishapa phase sites and the

incursion of Athabascan groups (Zier and Kalasz 1999:250).

The Developmental period dates between AD 100-1050 (1850-900 BP). After about AD 450, there appear to be differences between sites found along the Arkansas and Platte River systems, respectively. Sites along the Arkansas River system are assigned to the Graneros focus (Withers 1954), which is characterized by cord-marked pottery, corner-notched projectile points that are later replaced by side-notched forms and slab-constructed circular dwellings. The Parker focus, which might be merely a geographical variant of the Graneros focus (Butler 1986:213), or vice-versa, is heaviest in the Denver Basin and South Platte River Valley region, and may extend to the San Luis Valley. According to Baugh and Ericson (1994:269), the most recent (Developmental period) component at the Recon John Shelter may represent the most southerly and westerly extension of the traditional Plains Woodland complex, as exemplified by the Valley and Keith foci of the Central Plains.

The Diversification period dating between AD 1050-1450 (900-500 BP) of eastern Colorado contains variants of the Plains Village tradition, such as the Upper Republican complex, the Upper Purgatoire complex, the Apishapa phase and the Upper Canark Regional variant. The Upper Republican complex (AD1000-1450) is characterized as a sedentary culture based on hunting, gathering, and horticulture (Gunnerson 1987:68-71). It is located primarily in southern Nebraska and northern Kansas. The complex is associated with the prehistoric Pawnee by Strong (1935). The Upper Purgatoire complex (Dick 1963) is dated approximately AD 1000-1225 (Cassells 1997:223-224; Wood and Bair 1980:15), and is divided into three phases: Initial Sopris, Early Sopris, and Late Sopris (Cassells 1997:223-224). Subsistence during this time was a mixture of foraging and farming, and its architectural and ceramic styles reflect both Plains and Southwestern influences. It has recently been suggested that Sopris phase sites represent an archeological frontier of the northern Southwest (Mitchell 1996). Alternatively, Turner (1980) suggests that Sopris phase populations may be Athabascan, based on a fairly high frequency (23%) of triple-rooted molars in a Sopris phase skeletal assemblage from the Trinidad Lake area.

The Late Prehistoric Stage, which dates between AD 100-1450 (1850-225 BP) is the heaviest period of occupation in the PCMS (based at least on site numbers). Artifact assemblages suggest continuity with the preceding Archaic (Andrefsky and Zier 1988:VIII-3) in terms of material culture and basic life styles. However, maize and squash, as well as Southwest pottery styles, suggest influence from formative-level cultures to the south (Gunnerson 1987: passim).

The Apishapa Phase of the Late Prehistoric Stage is a heavily represented cultural component on the PCMS. The Apishapa phase (or focus) was first recognized by Renaud (1931) and formally defined by Withers (1954). It may have antecedents in the Graneros focus (Baugh 1994:269). It is characterized by villages—of varying size—composed of

upright slab-stone houses, often in defensible locations. The proximity of these sites to arable land (Campbell 1969:418-419) suggests some level of commitment to horticulture. Ireland (1968) proposed that at the Snake Blakeslee site (Gunnerson 1989) occupants subsisted primarily on corn and bison. Campbell (1969), using supposed similarities between Apishapa sites and contemporary materials in the Texas and Oklahoma Panhandles, placed this phase into the Panhandle aspect. Lintz (1978, 1984, 1986) in a reworking of this material, proposed the Upper Canark variant (AD1200-1500), which contains the Apishapa phase and the Antelope Creek phase of northeastern New Mexico and the Texas and Oklahoma Panhandles. Baugh (1994:282) has further added to the Upper Canark variant the Zimms complex of western Oklahoma and the eastern Texas Panhandle and the Burial City complex of the northeastern part of the Texas Panhandle (see also Drass 1998:418, 422-425).

A review by Chomko et al. (1990:14) sees significant differences between PCMS Apishapa sites and "classic" sites to the north. According to Chomko et al. (1990) the latter are characterized by side-notched points and cord-marked ceramics, whereas Apishapa sites on the PCMS tend to have corner-notched varieties and a marked absence of ceramics. Contrary to Chomko et al. recent investigations at the PCMS have reported ceramics in association with contiguous walled-structure sites (Krause 2001). The PCMS sites that are located on canyon rims possess evidence of stone defensive alignments. They also tend to be earlier; dates cluster at AD 1000 compared to AD 1300 (clusterings which coincide roughly with the change from Prairie Side-Notched (in fact, a corner-notched variant) to Plains Side-Notched (a true side-notched), as defined by Kehoe (1966). It is, however, too early to designate the PCMS Apishapa as a distinct phase or sub-phase.

The Protohistoric Period (AD 1450-1725) is characterized by ethnographically recognized tribes who were either hunters and gatherers, or part-time horticulturalists. Aboriginal inhabitants during this period had access to European goods, but were not in regular face-to-face contact with Europeans. A major Colorado Plains group was the Athabascans (specifically the Apache), who migrated south as part of the large Athabascan movement that began in Alaska sometime in the first millennium (Duke and Wilson 1994; Vickers 1994). They grew corn, beans, and squash, hunted extensively, and traded with Puebloan groups in northern New Mexico. These groups are represented archeologically by the Dismal River aspect (AD 1675-1725), which is found throughout large portions of the western Plains including eastern Colorado (Gunnerson 1987:102-107).

Archeological evidence suggests that the Apache entered southern Colorado sometime after AD 1300 (Campbell 1969:496). Excavations at a series of stone-circle sites associated with the Eastern Apache, located on the Carrizo Ranches on the Chaquaqua Plateau, were radiocarbon dated to the 14th century (Kingsbury and Gabel 1983). These sites also contained Pueblo IV pottery indicative of interaction with groups

to the south. Other tribes of note during this period were the Comanche, the Arapaho, and the Cheyenne.

The Protohistoric Period on the PCMS is represented in occupations probably assignable to Apachean and Shoshonean groups (Andrefsky and Zier 1988:VIII-4), although the evidence is meager and subject to the severe theoretical and methodological problems of assigning ethnic affiliation to material assemblages (Duke 1991).

The Ethnohistory and History of the Pinon Canyon Maneuver Site

There are very few ethnohistorical data for the actual PCMS (Stoffle et al. 1984), and so inferences must be made from those of surrounding areas. From the initial period of European contact, which began in the middle of the 16th century, Plains Indians underwent profound cultural, social, and economic changes, descriptions of which need not be replicated here. Initial contact was indirect, in the form of long-distance trade (beaver/muskrat pelts for numerous European goods), but was replaced by face-to face contact. In particular three items were significant. Beaver trapping (and later bison hide tanning) brought the Plains into the world economic system (cf. Lewis [1942]) for an early and surgical analysis of the economic and social effects of this on Northern Plains groups, particularly the Blackfoot). Acquisition of the horse and gun allowed Indian groups to resist European expansion, but more often than not this was done by taking over the territories of Indian groups who were not so well-equipped. The horse itself also caused major economic and social changes, which are well documented by Roe (1955). In general, the period of European contact, then, can be seen as one in which Indian groups were forced to become much more mobile and to cope as best they could with the European economic nexus into which they participated.

Southern Plains groups made contact with Spanish groups beginning in 1541, when Coronado led an expedition across parts of New Mexico and Kansas (Hammond and Rey 1940). Coronado's description of the groups he met provide a good description of peoples who were still essentially "prehistoric." Coronado encountered two groups called "Querechos" and "Teyas", although there is dispute as to whether both were plains Athabaskans (Apaches) or Apache and Caddoan groups respectively (cf. Weber 1988: XVIII-5-6). Beginning in the late 17th century, the Apache, mounted and heavily armed, became a dominant force on the Southern Plains, raiding for both horses and slaves that were then traded to the Spanish (Weber 1988: XVII-7).

Despite the unstable relations between Apache and Pueblo groups it was, nevertheless, the former to whom the latter fled after a series of revolts (the biggest revolt started in 1680 and lasted for 12 years). In the early part of the 17th century, the Taos and Jemez Pueblos revolted against Spanish rule, and established a new settlement called El Cartelejo in western Kansas, which was under the control of the Apaches. It is unclear whether El Cartelejo was a specific pueblo or a region, however (cf. Forbes 1960;

Schroeder 1974). By the 1660s the Spanish had moved the fleeing Puebloans back to their original settlements (Forbes 1960:137-139), although the area continued to act as a refugium for Puebloan and Apache groups trying to escape Spanish domination. Weber (1988: XVII-9) points out that this fact sheds light on PCMS ethnohistory, in that (1) it establishes the Apache very near to the PCMS, if not actually in it; (2) it indicates the probability of social and/or economic ties between the Apache and Puebloan groups; (3) the PCMS would have been situated precisely between any of the movements between the two groups.

Unfortunately, there are few specific references to the Apache in the PCMS, although the above data indicate that the Apache almost certainly claimed southeastern Colorado for at least part of the ethnohistoric period (Schroeder 1974). Specifically, Schroeder (1974) interpreted the 1706 route of Ulibarri's retrieval of Pueblo Indians from El Cuartelejo as passing east of present-day Trinidad, along the Emory Pass area and then down Chacuaco Creek to its junction with the Purgatoire River. There, Ulibarri found a group of Penxaye Apaches growing corn, beans, and squash. Interestingly, Hyde (1976:55) gives the creek's name as being derived from Chaguagua, the name of a Ute band. Ulibarri also reported that the Utes and Comanches were raiding the Apache between present-day Pueblo and Trinidad but had not yet succeeded in driving them out (Hyde 1976:64).

A later Spanish expedition in 1719 led by Governor Valverde also found Apache groups occupying southeastern Colorado (Schroeder 1974). Valverde's professed objective was to prevent Ute and Comanche raids on the Apache, although the leisurely nature of the expedition indicates that he had no urgency in accomplishing this (Hyde 1976:67-70); indeed, Valverde withdrew as soon as it became clear that he was going to make contact with the very Comanches he had been pursuing.

The Comanche, together with the Ute, succeeded in driving the Apache from southern Colorado and adjacent Kansas at the beginning of the 18th century (Weber 1988: XVII-13). With the exception of their defeat by de Anza in 1779 in the vicinity of modern-day Pueblo, the Comanche continued to expand their hegemony throughout the southern Colorado plains and areas to the south and east during the 18th century.

The Utes raided with the Comanche throughout most of the Colorado plains until the middle of the 18th century, when the Comanche turned on them. The Utes were originally mountain dwellers who made incursions into the Plains through numerous mountain passes (Hyde 1976:54-57; papers in Nickens [1988]). The Ute Indians allied with numerous Indians during the 18th century, but principally with the Comanche until that alliance dissolved in the mid 18th century.

During the latter part of the 18th century, increasing Arapaho and Cheyenne incursions into the western Plains began to shunt the Comanche southward (Hyde 1976).

Indeed, by the 1820s large camps of these groups were reported as far south as Pueblo County in southern Colorado (Weber 1988:XVII-18).

During the latter part of the 18th century and continuing into the first half of the 19th century, southern Colorado was contacted by comancheros and ciboleros (Hispanic and Pueblo Indian traders and buffalo hunters) (Weber 1988:XVII-15). The comanchero trade was based on well-established prehistoric trade patterns between Pueblo farmers and Plains bison hunters (cf. Spielmann 1991). Initially involving native corn and bison products, by the beginning of the 18th century, the trade system incorporated Spanish goods, including horses and guns, as well as slaves. Trade fairs, such as the one at Taos, become an important component of the New Mexico economy (Carrillo 1988a:XVIII-8). This changed, however, under American rule, since the comancheros were now considered to be thieves and villains (Carrillo 1988a:XVIII-9).

Cibolero hunting comprised huge bison-hunting expeditions from New Mexico into the adjacent plains in order to take back bison products to their home settlements. These expeditions climaxed in the early 19th century. Bent's Fort constructed in 1833 just east of La Junta, Colorado, also increased the numbers of Indian traders moving through the area. Increasingly, Anglo traders were attracted to southern Colorado and northern New Mexico to trade with both Indians and Hispanic settlements (Weber 1988:XVII-18-19).

Up to 1821, the ethnohistoric period of southeastern Colorado, as for adjacent areas, was characterized by processes that led to the demise of aboriginal groups as independent entities and increasing control over these areas by Spanish centered to the south. However, this area was never successfully colonized by the Spanish (Carrillo 1988a:XVIII-7), and it gained importance primarily for the resources that could be taken from it through trading and other activities.

Carrillo (1988a:XVIII-7) identifies comanchero trade, cibolero trade (mentioned earlier), and the sheep industry as the most important economic activities for this area during this time period. The first two have been briefly described earlier. The sheep-ranching industry climaxed in the final decades of Spanish rule with close to 500,000 sheep being driven south to Mexico every year (Carrillo 1988a:XVIII-13).

After 1821, what Carrillo (1988a:XVIII-1) calls the second period of historical culture change in the area was initiated. Mexican independence opened up trading opportunities between southern Colorado and Hispanic settlements to the south. For instance, pobladores settled the northern borderlands, appearing in southern Colorado by the 1850s (Carrillo 1988a:XVIII-22), and Carrillo (1988a:XVIII-14) sees similarities between descriptions of their settlements and some of the archeological remains of the PCMS. This second period lasted until the Mexican War of 1846-48 effectively ending Mexican domination of the area.

The 19th century saw increasing military pressure on Indian groups from the United States. In 1851, the U.S. government decided to allocate specific tribal territories to the individual groups (Weber 1988:XVII-19-20), and in 1867 the government signed a treaty with numerous southern Plains tribes, including the Comanche and Kiowa-Apache. This led ultimately to the Reservation Period and the removal of tribes from their homelands. The Comanche, for example, were placed on a reservation in western Oklahoma (Wallace and Hoebel 1952). The American Period officially begins in 1849 (Carrillo 1988a:XVIII-14). The PCMS became part of the newly defined Territory of Colorado, enacted by Congress in 1861.

Of major concern was the need to open up southern Colorado to commerce, and for this freight (and later mail) companies were needed. Although the Santa Fe Trail, a spur of which passed close to the PCMS, had been open since the 1820s, stage stations for independent companies were established. In 1866, for example, the Hole-In-The-Rock station was opened near present-day Thatcher, Colorado (Carrillo 1988a:XVIII-20).

Throughout the 1870s population increased as the mining and agricultural potential of Colorado were realized, and as a result, various railroads were constructed throughout southern Colorado (Carrillo 1988a:XVIII-21). The traditional comanchero and cibolero activities were closed down, and permanent settlements, both Hispanic and Anglo, began to appear. The former settlements tended to be more self-sufficient and communal than the individual family ranches of the Anglos that depended on local merchants for most of their supplies (Carrillo 1988a:XVIII-21). Ranching was still based on a mixture of sheep and cattle.

As the 19th century came to a close, Hispanic settlements were gradually bought out by Anglo ranching concerns (Carrillo 1988a:XVIII-21), with Texas cattle drives and the influx of large numbers of open-range cattle beginning the "industrialization" of ranching. In the PCMS area, the two largest cattle concerns were the Prairie Cattle Company and the Bloom Land and Cattle Company. In 1882, Sharps Ranch was established along Lockwood Arroyo (Carrillo 1988a:XVIII-33).

Large commercial interests, often bankrolled by British money, dominated the cattle ranching industry until 1909 when the Enlarged Homestead Act, together with improved agricultural technology and wheat varieties, encouraged small family farming homesteads to flourish in southern Colorado (Carrillo 1988a:XVIII-34-35). Until the middle 1920s, an improved climate, together with the construction of a fairly sophisticated irrigation system at Model, Colorado, encouraged the local population to grow. Unfortunately, a drought that begin during the late 1920s ended most of these homesteads and the land reverted back to ranching again. A local helium industry and the construction of a booster station temporarily alleviated some of the pains of unemployment, but continued occupation of the PCMS and surrounding areas during the 1930s was made possible only by federal price support systems (Carrillo 1988a:XVIII-

37).

From the end of the Second World War to the early 1980s, cattle ranching provided the economic mainstay of the area, but it was a tenuous existence at best. In 1983, the 12 ranches that now constitute the PCMS were bought by the U.S. Army, and the end of civilian control and use of the PCMS area effectively came to an end (Carrillo 1988a:XVIII-39).

CHAPTER 3
REVIEW OF PREVIOUS ARCHEOLOGICAL WORK IN THE PINON CANYON MANEUVER SITE

Introduction

The history of archeological research on the PCMS is recent for a number of rather obvious reasons. Most importantly, as described elsewhere in this volume, archeological research on the Plains in general is, compared to many other areas on the continent, relatively recent. Also, most of eastern Colorado is privately owned and, therefore, not covered by the numerous federal laws pertaining to historic preservation. The PCMS, however, was transferred to the public domain in 1983, and intensive archeological investigations were initiated soon after.

According to Zier and Kalasz (1999), archeological investigations in southeastern Colorado can be subsumed under three categories: early investigations, Pre-1949; Academic Studies and Early CRM Archeology, 1949-1978; and CRM archeology, 1978-present. Little archeological emphasis was directed specifically at the area contained within PCMS until1983 when the U.S. military acquired the property through public domain. The pre-1949 interest in southeastern Colorado mainly focused on architectural sites and rock art along the Apishapa, Purgatoire, and Arkansas drainages. Perhaps foremost among the early explorers was E. B. Renaud of Denver University. His research spanned 17 years and resulted in the documentation of more than 1000 sites, the great majority of which were in the Arkansas basin (Renaud 1931, 1932, 1933, 1937a, 1937b, 1942a, 1942b; Renaud and Chatin 1943). The era of Academic Studies and early CRM archeology before 1978 continued the interest initiated by Renaud and focused attention on architectural sites and cave sites mainly attributed to the Late Prehistoric Period such as Snake Blakeslee (Chase 1949) and Trinchera Cave.

It is in the last twenty years that considerable work has been conducted on the PCMS under the rubric of CRM obligations for the United States Department of Defense. Since 1983, archeological investigations in the PCMS have been carried out by both university and private consulting agencies: University of Denver (DU), University of Wisconsin-Parkside, Powers Elevation, University of North Dakota (UND), Western Cultural Resource Management (WCRM), Gilbert-Commonwealth, New Mexico State University (NMSU), Fort Lewis College (FLC), University of Colorado at Colorado Springs (UCCS) and others. In 1988, Larson-Tibesar Associates (LTA) of Laramie, Wyoming, were contracted to synthesize existing historic and prehistoric data. These efforts resulted in a six-volume report. This report remains the single most important reference for research on the PCMS (Andrefsky 1990).

In 1983 and 1984, DU was contracted to conduct archeological surveys in the PCMS. This work resulted in a number of volumes, each addressing aspects of the overall program

of research (e.g. Kvamme et al. 1985; Peebles 1984; Pozorski and Pozorski 1984a, 1984b). The Hogback and canyon areas were surveyed in 1983 as well as portions of the upland mesas and plains. Approximately 53,500 acres (21,4000 hectares) throughout the base were surveyed during the 1983 and 1984 field seasons and fifty sites were tested. The resultant data were used to generate a predictive model for high-probability site areas that were subsequently investigated (Kvamme 1984, 1992). The archeological data were then synthesized into a three volume manuscript edited by Christopher Lintz (1985).

In 1987, LTA was contracted to reevaluate 68 of the DU sites and to complete their field documentation, as well as to record 23 archivally documented historic sites. Additionally, further sampling inventories were conducted. LTA produced a two volume synthesis of test excavations conducted on 50 sites in the PCMS in 1983 (Andrefsky 1990).

Of great interest is the quantity of rock art in the PCMS (Cole 1984, 1985; Loendorf 1989, 1998; Loendorf and Kuehn 1991; Loendorf and Loendorf 1999; Zier 1988). Panels are both pecked and painted, representational (human and animal) and abstract. Much of the rock art is located close to the basaltic Hogback. Here it is found not only on rock faces but also on individual boulders. The sites are difficult both to date and to assign to specific ethnic groups.

The geoarchaeology and geomorphology of southeastern Colorado is now much better understood as a result of studies by Schuldenrein (1985) at the PCMS. Of particular value is the predictive geoarcheological model generated by this work. In a later study of the PCMS, McFaul and Reider (1990) reconstructed more than 13,000 years of alluvial and eolian history. They identified episodes of terrace and eolian deposition and two paleosols. They suggested the possibility that these depositional sequences hold the potential to produce buried archeological deposits perhaps as far back as the Paleoindian Stage.

Historical studies and syntheses have also been provided by Powers Elevation (Friedman 1985), Gilbert/ Commonwealth Inc. (Haynes and Bastian 1987) and the University of Wisconsin at Parkside (Stoffle et al. 1984). Ethnohistoric information related to the PCMS was recently complied into a single volume (Jones et al. 1998), which includes both PCMS and FCMR military reservations.

Pinon Canyon Maneuver Site Literature Review

Some of the earliest archeological investigations conducted on what is now the PCMS were probably those of E. B. Renaud in his documentation of the archeology of Eastern Colorado (Renaud 1931, 1932, 1933, 1937a, 1937b, 1942a, 1942b; Renaud and Chatin 1943). However, few of these sites are definitely placed within the PCMS boundary. Once the U.S. Army acquired the property in 1983, cultural resource projects have become the standard. These include inventory and evaluation (Andrefsky and Sanders 1987;Carrillo et al. 1996; Guthrie et al. 1984; Haynes and Bastian 1987; Hunt 1999; Loendorf and

Loendorf 1999; NPS 1989; Owens et al. 2000, Owens and Loendorf 2002), geophysical surveys (Bevan 1992; DeVore 2002; Weymouth 1991), evaluative testing (Ahler 2002; Andrefsky et. al. 1990; Charles et. al. 1996, 2005; DeVore 1993; Loendorf et al.1996; Pozorski and Pozorski 1984; Shiavitti et. al. 2001), data recovery (Carrillo et. al. 1993; Hardesty et. al 1995; Hunt 1999), and rock art documentation (Cole 1984; Kordecki and Loendorf 1988; Loendorf 1998; Loendorf and Kuehn 1991).

Testing and large-scale excavations by the Department of Anthropology at UND at sixteen sites occurred from 1990 through 1991 (Loendorf et al. 1996). Of these sixteen sites, eleven were open site types, three were rockshelters, and two possessed remains of rock structures. One of the stone structural sites was likely the product of a historic site-use episode. The majority of these sites are located along Burke Arroyo or nearby in the hills and arroyos. Additionally most of these sites date between 2500 and 1000 BP

In 1994, evaluative testing of eight archeological sites on the PCMS was conducted by FLC. This was one of a few projects involving test excavations on the PCMS up to this time. These eight sites, seven prehistoric and one historic, were dispersed over the base. Five of the eight, including a historic site, were recommended as meeting the requirements for significant resources under Criterion D of the NRHP (Charles et. al. 1996).

During the field seasons of 1995 and 1996, an archeological inventory was conducted in Welsh Canyon, a tributary of the Purgatoire River by NMSU. Archeologists found and recorded 234 sites. These were dominated by rockshelter and cave sites in the upper reaches of the canyon and procurement sites in the lower regions (Loendorf and Loendorf 1999).

In 1996, NMSU, under another cooperative agreement with the NPS, conducted archeological research on the PCMS. This research consisted of subsurface testing and mapping of 11 sites in Welsh Canyon for the purpose of NRHP evaluation. Ten of the eleven sites date to the prehistoric period and eight of the eleven were recommended as potentially eligible for the NRHP (Schiavitti et al. 2001).

In 1997, a large scale archeological inventory and reconnaissance was conducted by NMSU of the Black Hills region of the PCMS. Approximately 2293 hectares (5663 acres) were inventoried resulting in the discovery and recording of 325 sites, all but one of which possess a prehistoric or protohistoric component (Owens et al. 2000). The sites were dominated by lithic scatters and range in age from Paleoindian to historic Euroamerican homesteads. Of the 325 sites, 41 were recommended as potentially eligible for inclusion in the NRHP (Owens et al. 2000:23).

A recent project at the Barnes Site, 5LA9187, was conducted by NMSU during the summer of 2001. This project was sparked by the discovery in 2000 of a broken Folsom point and other possible Paleoindian artifacts. The field work consisted of surface reconnaissance, backhoe trenching and test unit excavations. Extensive geoarcheological and

geochronological analyses were conducted on the exposed profiles. Geophysical surveys completed the investigations at the site. These included electrical conductivity, gradiometer, and magnetic susceptibility. The results of the investigations demonstrated that all tested sediments date from 7600 BP or younger. Although a buried Paleoindian component was not identified, a significant Late Prehistoric component was discovered that included a hearth, storage pits, and exotic artifacts (Ahler 2002). One of the most significant aspects of this site is the presence of over 150 side-notched projectile points, hundreds of ceramic fragments, and over 200 shell beads. This Late Prehistoric component confidently dates to circa 700 BP (Ahler 2002).

Field work on the historic sites has not been as extensive as that of the prehistoric sites. Until the current report, nine historic sites were tested. These include sites 5LA5360 tested by FLC in 1994 (Charles et al. 1996), site 5LA3421 also tested by FLC in 2002 (Charles et al. 2005), those tested by Minette Church for her dissertation (2001), and two stage stations, Brown's Sheep Camp (Hunt 1999), Lockwood Stage Station (Hardesty et al. 1995), and Bent Canyon Station (Church and Cowen 2005).

In 2002, a crew from FLC conducted evaluated testing a at large multicomponent historic and prehistoric site, 5LA3421, near the head of Big Water Arroyo. Geophysical surveys and extensive testing were conducted. The historic component consisted of a an extensive artifact scatter and several structure foundations. Historical documentation demonstrated that the structures are attributed to the Harry Leplatt homestead. Test results supported the historical records that the site was occupied in the early 1900s. Testing in the prehistoric component identified two possible prehistoric occupation periods–one near the surface and another buried at a depth around 70 cm bgs. *Zea mays* pollen was found in the pollen samples taken from the test units. Charcoal produced conventional radiocarbon dates of 990±40 BP, 2660 ± 110 BP, 3690±40 BP, and 6900±40 BP Subsurface testing identified an abundance of artifacts, two buried features, charcoal for radiometric dating, and a buried paleosol. The site was recommended as potentially eligible for inclusion in the NRHP.

Despite the essentially management-oriented nature of the work in the PCMS, it is encouraging to note that the general public and individual researchers have been given access to the wealth of archeological data generated by these studies. Thus, portions of the Larson-Tibesar synthesis have been published as a memoir of the Colorado Historical Society, giving the public a much-needed synthesis of work in the PCMS (Lintz and Anderson 1989). Others have also initiated projects. For instance, Chomko, DeVore and Loendorf (1990) offer a reappraisal of the Apishapa Phase of southeastern Colorado based on PCMS data, while Kvamme (1992) reports on the results of a GIS-based, predictive site-location model for the High Plains which is based on the inventory data collected from the PCMS. Loendorf and Kuehn (1991) have presented a synthesis of rock art in the Pinon Canyon. Moreover, Loendorf (1991) published in the international journal *Antiquity* an innovative and important study of cation-ratio varnish dating of ten rock-art sites in the PCMS. Utilizing data acquired from the cultural resource inventory of the PCMS Andrefsky (1994) published an article on

lithic procurement in *American Antiquity*. Most recently Minette Church (2002) published an article in the *Journal of Social Archaeology* on homestead landscapes in southeastern Colorado with the primary database from her work at PCMS.

Finally, the findings of the archeological work at PCMS have also been presented to the public through television programs shown on Public TV. An overview of cultural resources from the PCMS has been shown on KRMA TV of Denver (Chomko et al. 1992), and a program on rock art has been broadcast by KTSC TV of Pueblo (Loendorf and Gange 1990). A third video in the Cultural Resources Series, *Souls of the Purgatoire*, written and directed by Hadley R. Harper and told by Keith Carradine addresses the history of the Pugatoire Valley from the perspective of the long-time residents of the PCMS and surrounding area (Harper 1996).

CHAPTER 4
RESEARCH DESIGN AND OBJECTIVES

The specific field and laboratory techniques used in this project are documented elsewhere in this report. These techniques were used to evaluate sites 5LA3333, 5LA4417, 5LA5612, and 5LA6108 for inclusion in the National Register of Historic Places (NRHP).

The federal legal criteria used in this evaluation are found in 36CFR60.4 and are as follows:

The quality of significance in American history, architecture, archeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
B. that are associated with the lives of persons significant in our past; or
C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. that have yielded or may be likely to yield information important in prehistory or history.

Sites may have national, state, or local significance.

The Colorado Plains Prehistoric Context (Eighmy 1984:48-49, 64-65, 77-78, 103, 142-143,152-153) and the updated version (Zier and Kalasz 1999) provide criteria for each of the major cultural periods represented on the Colorado Plains that further assist in the evaluation of a site's significance and potential eligibility for inclusion in the National Register. Larson-Tibesar Associates provide a specific context for evaluating sites that may contribute to a greater understanding of the prehistory and history of the PCMS (Andrefsky 1990).

The prehistoric research design established for the PCMS by Andrefsky and Zier (1988) is based on four traditional research approaches. The first is the question of evolution versus adaptation, as defined by Michlovic (1986). According to this model, prehistoric groups on the plains did not evolve in the sense that they made directional and immutable changes to their cultural systems. Rather, they made slight adaptive responses to environmental fluctuations. The underlying theme of this particular element is that change -

for example, the adoption to pottery–is so obviously beneficial that no "underlying causal mechanism" needs to be sought.

According to Michlovic (1986) and Andrefsy and Zier (1988), diffusion can be re-adopted as adequate explanation for some observed changes in the archeological record. However, the model still leaves unanswered the reason for the adoption of particular traits by societies who had, presumably, been successful in their lifestyle for centuries before those traits became available (cf. Duke 1991). As such, the model remains merely a statement of a truism–people change because they want to.

The second element is a reliance on general systems theory, which as used in archeology is essentially 1930s-style functionalism. This model tends to downplay the importance of internal causes of socio-cultural change in favor of external ones, in particular the environment.

The third element to the research design is the assumption of a close correlation between food shortages and archeologically visible changes in the sociocultural system, particularly settlement patterns and site sizes.

The final element is the assumption that hunter-gatherers will try to optimize their behavior in order to minimize effort and maximize resource procurement. The general location of sites in terms of access to specific sites is then refined to specific micro-locations (Duke 1978) through such factors as shelter, aspect and drainage (Jochim 1976; Duke 1978). The degree of sedentism at a particular site can be determined archeologically by such features as the complexity of architecture, the stability of the surrounding resource base, and its ability to be defended.

Utilizing these assumptions, Andrefsy and Zier (1988:VIII-9-13) provided a preliminary settlement model for the PCMS. Sensibly passing over the Paleoindian stage, because of inadequate data, they propose that during the Archaic human populations either dispersed or congregated, depending on the seasonal availability and type resources, both food and non-food (large winter encampments along the main river valleys would be followed by smaller summer expeditions that went as far as the Rocky Mountains to the west). This is similar to an earlier model proposed by Guthrie (1984) and based on Binford's (1980) collector-foraging model. Large residential base camps are located along the canyons, where evidence for manufacturing and maintenance activities, together with natural shelter suggests some degree of seasonal sedentism. Smaller field camps in the steppes and hills served as specialized resource procurement stations. Guthrie (1984) concluded that a complete seasonal round was supportable in the PCMS.

The changes during the Late Prehistoric Stage, in terms of greater sedentism and access to cultigens, caused an adaptive shift in seasonal movements, especially in terms of the switch to winter encampments in ecologically diverse canyons, rather than along the

major river valleys. Environmental degradation due to severe drought that occurred after AD 1000 produced an increase in contemporary sites along the east side of the Purgatoire River, perhaps in response to water availability.

More specifically, the context report prepared by Larson-Tibesar Associates (Andrefsky 1990) for the PCMS takes the form of a set of five research domains that they believe will contribute substantially to this goal understanding the prehistory and history of the PCMS.

The first, chronology, is the most important. Projectile point styles are only partially adequate for constructing a chronology, for numerous reasons such as the long time-span of particular styles and their general lack, so far, of association with radiometrically dated components. Ceramics are a phenomenon of approximately only the last two thousand years in this part of North America, and the heavy use of cord-marking as a decorative motif limits their use as more sensitive temporal indicators. As suggested by Andrefsky and Zier (1988:VIII-14), radiocarbon, archaeomagnetic, and obsidian hydration techniques need to be used more often in the construction of a local chronology.

Domain 2, paleoenvironments, is crucial to understanding the processes of cultural change in the PCMS. As noted earlier, the regional models of Antevs (1955) and, later, of Wendland and Bryson (Wendland 1978; Wendland and Bryson 1974) are guides only. Local tests of the latter model (e.g. Wilson 1988) have shown the time-transgressive nature of their episodes. Schuldenrein et al. (1985:223-225), for example, has produced a reconstruction of the first millennium climate in the PCMS that is at odds with other scholars' interpretations.

The archeological record at PCMS particularly lends itself to detailed investigations of Domain 3, settlement and subsistence systems. Analyzing the patterns of archeological sites across a region such as PCMS contributes not only to the study of human-environment relations, but also to such phenomena as diffusion and trade.

Domain 4, exchange and mobility, is a corollary of the previous research domain. Unfortunately, as is evident in a recent synthesis of exchange systems in prehistoric North America (Baugh and Ericson 1994), the problems of distinguishing, in the archeological record, between the physical exchange of goods and the movement of people as explanations for exotic materials are considerable.

Domain 5, predictive modeling, addresses the use of univariate and multivariate statistical techniques to improve predictive capabilities for the PCMS. Patterns in site locations can be used to predict settlement and subsistence patterns elsewhere in the PCMS, and these are of use to both management and research objectives.

Friedman (1985:138-429) established five research domains for historic archeological studies in the PCMS: chronology; settlement; economies; demography; and culture. Carrillo (1990:XIX-1-4) integrated Friedman's work first with Hardesty's (1980) concept of the frontier, whereby zones of cultural transition are distinguishable from cultural zones on either side of it, and secondly with South's (1977) postulate that patterns in historical data will be correlatable with specific facets of human behavior, such as ethnicity. Carrillo (1990: XIX-3-4) also developed specific research objectives and test implications that would enable him to use strictly archeological data to supplement and augment historic documentary evidence (cf. Carrillo and Kalasz 1988; Kempton and Baber 1988; Kempton and Carrillo 1988; Carrillo 1988a, 1988b, 1988c, 1990 for detailed discussions of this work).

CHAPTER 5
FIELD AND LABORATORY METHODS

Field Methods and Techniques

Field methods rigorously followed those prescribed in the *Guidelines to Required Procedures for Archeological Field and Laboratory Work at Pinon Canyon Maneuver Site, Las Animas County, Colorado* (Dean 1992). The reader is referred to this document for procedural detail. Deviations made from these guidelines are identified in the individual chapters. The purpose of the project was to evaluate four sites for their potential to provide significant information about the history and/or prehistory of the PCMS. Investigations at each site were terminated only after testing provided a sufficient level of information to allow an eligibility recommendation to be made. The acquired information will help with future management decisions made in regards to the four sites examined during investigations by FLC in 2003.

Surface Investigation

Upon arriving at each site, a general surface reconnaissance was conducted which allowed the crew to get oriented to the site and hopefully relocate the site datum. If the original site datum was not relocated, a new rebar site datum was established. Each site was inventoried for surface artifacts prior to subsurface testing to define artifact concentrations, temporal component boundaries, and to locate any diagnostic artifacts. At historic sites concentrations of tin cans, glass, buttons, miscellaneous metal, and historic ceramics were recorded as artifact clusters. Initial survey efforts to record prehistoric artifacts followed those guidelines laid out by Dean (1992). Prehistoric artifacts included bifaces, flaked lithic tools, non-tool flaked lithic debitage, and groundstone.

Mapping A Topcon Total Station positioned over the site datum was used to map the site. Unless otherwise noted, the datum was designated arbitrarily as 100 m north and 100 m east to avoid using westings and southings. An arbitrary elevation of the datum was set as 100 m to avoid the occurrence of negative elevations. Due to the overall size of some sites, several subdatums were set for ease of mapping and higher accuracy of information. Because magnetic north is used for the geophysical surveys, all grid points and subdatums were set to magnetic north. Subdatum locations were shot in from the main site datum. A Trimble Geo Explorer III Global Positioning System (GPS) was used to record the locations of the main site datum and subdatums.

Mapping was consistent across the entire site. All diagnostic or collected prehistoric and historic artifacts and features were mapped and plotted. Non-diagnostic artifacts were also mapped in order to record the distribution of artifacts and to complete a map of the site boundary. Additional mapping points included topographical boundaries such as drainages, military fence boundaries, disturbances from mechanized vehicles, test units from previous archeological investigations, and the location of all archeological investigations (i.e. geophysical survey grids, test units, auger, and shovel tests) conducted by FLC during the field season.

The Total Station data were downloaded regularly in the field using the software TDS Survey Link. The data were then brought into ArcView to produce a map for field reference. Once in the lab, the field data were downloaded into AutoCAD 2002, a drafting program from Autodesk, Inc. Contours for the site map were created from the Total Station data that were brought into Surfer 7, a contouring and surface mapping software program from Golden Software, Inc. The geographic data collected from the Trimble GPS units in the field were downloaded into the Pathfinder Office Software. Feature planviews were created in CorelDRAW 7 and were referenced to the main site datum.

If significant changes were noted to the site features or if new features or structures were identified, detailed feature maps were drawn by hand. If no significant changes to feature maps were observed, the original maps were reused in their entirety.

Geophysical surveys Geophysical surveys were conducted on two sites, 5LA3333 and 5LA6108. F LC owns and operates two instruments, a magnetometer (fluxgate gradiometer) and an electrical resistance meter. Both magnetic and resistance surveys were conducted at the two sites. These surveys are almost identical to those conducted at the PCMS by Steve DeVore of MWAC at the Barnes Site (Ahler 2002) and by FLC at 5LA3421 (Charles et al. 2005). A system of 20 m x 20 m grids was superimposed over the areas chosen for investigation. The grid corners were mapped with the Total Station. The grid was aligned with magnetic north and wooden grid stakes were placed at each corner.

The survey was completed efficiently by using a set of three ropes marked at one meter intervals. Two of the ropes were placed parallel to each other along the north and south grid boundaries and served to guide the traverse interval. The other rope was used perpendicular to these and served to guide the sample interval. The zig-zag method was used exclusively during the survey. In this method, samples were collected from south to north to the end of each grid. The operator then moved to the east one meter and continued taking points down the line from north to south. Survey of each grid started in the southwest corner and continued in a clockwise direction through to the southeast corner. If a point could not be taken because of rocks or vegetation a dummy log (no value) was assigned to it. At the end of each day, the data were downloaded into a laptop computer and into Geoplot software. Data were collected internally by the instruments. General information about the site, grid, and instrument set-up was recorded on field geophysical survey forms. Specific comments about the readings were noted directly on the data sheet. The gridded square is used to illustrate surface features, obstacles or anomalies.

Gradiometer Magnetometer or gradiometer surveys work on the principle that buried artifacts, features or changes in the soil produce minute changes in the earth's magnetic field. The earth's magnetism is caused by an east-west flowing current regime at the core-mantle boundary deep within the earth's core. The interactions between the hot, liquid metal outer core as it rotates and convection within the inner core creates circular currents. These currents create a magnetic field. This magnetic field has a distinctive dip from the poles to the equator (Clark 2003). Soils or

obstacles beneath the earth's surface (or on the surface) can locally modify the earth's magnetic field. Magnetometers and gradiometers measure either the total strength of the magnetic field (in the case of proton magnetometers) or they measure the component of the field along the axis of the sensor, (as is the case with gradiometers) (Mussett and Khan 2000). In either case, they are all measuring the same thing - the strength or amplitude of the earth's magnetic field (Bevan 1998). Magnetic surveys are nonintrusive and are passive geophysical techniques.

In a magnetic survey, the instruments measure the warping or distortion of the earth's magnetic field caused by ferrous materials (iron) and by oxides of magnetite, hematite, and maghematite (Clark 2003).On archeological sites, the oxides are usually the most significant compounds. They are mostly subtle and can only be detected with sensitive magnetometers. These magnetic anomalies can retain a permanent or remnant magnetization when placed in a magnetic field or they can acquire a temporary magnetization that is lost when the field is removed. Thermoremanence is permanent magnetization and can be caused by firing beyond the Curie point, which effectively demagnetizes the oxides. Upon cooling, the oxides are re-magnetized by the earth's field and align with the geomagnetic field at the time of the firing. This concept is inherent in thermoluminesence dating. In cases of pottery kilns, hearths, and roasting pits, the magnetism is relatively strong and can be easily detected. More subtle features such as unfired pits, house fills, ditches, and roads can also be detected with the magnetometer because topsoil is normally more magnetic than underlying subsoil or bedrock When features are filled, either intentionally or unintentionally with topsoil, they will produce a positive magnetic signal. Less magnetic material intruding into the topsoil, such as many kinds of masonry, can be detected by a subtractive effect, which gives a negative magnetic reading (Clark 2003). Highly magnetic (ferrous) items can produce dipole readings (high and low).

Magnetic field strength is measured in nanoteslas (nT; 10^{-9} Tesla). The earth's magnetic field strength ranges from about 40,000 to 50,000 nT (Weymouth 1986:341). On the other hand, magnetic anomalies of potential archeological interest can, on-the-average, lie within ±5 nT, and soil unit differences can be as subtle as 0.1nT or less (Kvamme 2001).

The magnetometer used at the PCMS is a Geoscan FM36 fluxgate gradiometer. Samples were collected 8 per meter (0.125 m) with a 1 meter traverse width. This instrument measures the strength of the magnetic field in a particular direction and, therefore, must be aligned and balanced in this direction. A zero reference datum was established beyond the grids. Instrument alignment and balancing took place at the beginning of the day and after lunch to correct for, among other things, fluctuating temperatures.

A portable laptop computer allowed us to download data throughout the day. Data were collected by only one person, therefore reducing human error. The intense heat at the sites in July and August caused problems with the readings. Some of these heat-induced fluctuations could be corrected for during post-processing; some of the noise apparent in the final maps is due to the extreme heat.

Electrical Resistance Electrical resistance surveys work on the principle that anomalies beneath the ground can be detected by differences in their resistance to the flow of an electrical current. These surveys measure the distortion of an induced electrical field caused by something in the subsurface. In our case, these are potential archeological or cultural features (Clark 1990). Because an electrical current is injected into the ground to generate an electrical field, this type of survey is considered to be an active one.

To cause a charge to flow, voltage must be applied. Voltage is also referred to as potential difference (a measure of the energy used to move the charge). As the voltage is applied and the current flows, a resistance is encountered to the movement of the charge. The resistance is dependent on the physical characteristics of the medium in which the charge flows. The basic measure of the resistivity is the Ohm-meter or Ohm centimeter.

The resistance to the flow of electrical current in sediments and soils depends on several variables. Important variables are soil moisture and soluble salts (mobile ions), but the most important is the soil moisture content. Other significant variables to resistance include soil permeability and temperature. For more detail on the properties that influence soil/sediment resistivity, the reader is referred to Weymouth and Huggins (1985:222). Seldom is there a one-to-one correspondence between an individual variable and the resultant resistance data. On the contrary, these variables show wide spatial variation depending on environmental conditions. Therefore, the resistivity of different archeological sites changes accordingly. Since no two archeological sites possess the same subsurface properties, the resistivity data from different archeological sites varies. It is entirely possible that a feature that is easily found by resistivity survey in one location may be imperceptible in another (Weymouth and Huggins 1985:224). If the sediments are completely uniform, there will be no contrast in the electrical data, and the resulting map will be featureless. When the archeological feature (or geological feature) differs from the sediments in various properties, the induced electrical field is no longer uniform. The resistance either increases or decreases. The differences in the electrical properties or contrast, combined with the size and depth of archeological features produces a record that can be mapped (Somers 1998:83).

The resistance survey was conducted with a Geoscan RM15 Resistance Meter. The Twin-probe array (PA1 or PA5) configuration was used throughout. In this array two mobile probes (C_1, P_1) are fixed to the instrument frame and two remote probes (C_2, P_2) are placed at a distance from the area to be surveyed. A 0.5 m distance between probes was selected for the mobile probes. A probe distance of .5 m was anticipated to detect features at depths between 0.25 m and 1.5 m below the surface. Samples were collected two per square meter. This was accomplished using a 0.5 m sample interval and a 1 m traverse interval. It was believed that this sampling density would be sufficient to detect most buried features at the sites.

The remote probes were always placed at a distance of ≥15 m from the grids that were being surveyed. Fifteen meters is required because the spacing between the remote probes and the mobile probes has to be 30 times that of the probe distance (0.5 m) to keep the change in apparent resistance under 3% (imperceptible variation) across the grid. The process of moving the remote probes so that

they always remained 15 m or more from the grids while keeping in a linear pattern took careful planning from the outset. In some instances, several resistivity datums had to be established to complete the survey.

Each time the remote probes were moved, they had to be referenced to their previous location to insure that the edges between the grids would remain seamless on the map. This required that the instrument be moved to a new location near or within the next set of grids to be surveyed. While the remote probes were still in place, a value reading in Ohms was taken at the new location. The remote probes were then moved to a new resistivity datum location and the Ohm value obtained from the instrument was matched to the Ohm reading at the new datum location. This was accomplished by moving the remote probes apart or together until the Ohm value was the same between the old datum and the new resistivity datum. The Ohm reading then became the value of the datum.The spacing between the remote probes is not critical and can be adjusted to between 0.25 m and 2 m, if necessary.

The memory in the RM15 resistance meter is such that it could hold an entire day's worth of data, therefore, it was not necessary to download during the day. Each night, the data were downloaded to a laptop computer. Unlike the gradiometer, the heat was not a problem for the resistance meter; however, the dry sediments may have influenced the resistance reading slightly because of the inverse relationship between resistivity and conductivity.

Gradiometer and Resistance Data Processing The magnetic and resistance data were recorded in the instruments' memories and downloaded into a portable laptop computer. All the data were brought into Geoscan Research's GEOPLOT software program. In this program, the data are separated into the individual grids. Because the magnetic data are stored as a string of values, the operator must identify the survey parameters in the software so as to let the software know where to stop one grid's points and start another. Individual grids were combined to form a master grid and then a composite grid was created from the master grid. Shade plots and relief plots were made from the data from both surveys. The data were subjected to a series of post-processing functions intended to remove unnecessary noise, smooth the data, and bring out subtle features. After the data were post-processed, they were exported as ASCII files and imported into Surfer 7. From here, image and contour maps were generated.

Subsurface Testing

Auger Test Probes (ATP) Auger testing was conducted to establish the nature of the subsurface deposits at two sites, 5LA3333 and 5LA6108. At 5LA3333, auger tests were used to collect preliminary data on subsurface deposits in areas that had been identified as possible features to determine whether further excavation was warranted. At 5LA6108, auger testing was used in two ways. First, auger test probes were inserted into the bottom of test units after culturally sterile deposits were encountered to further examine soil deposition and the potential for buried cultural deposits. Auger probes were also conducted to test a resistance anomaly encountered during the geophysical survey. Each ATP was excavated to culturally sterile substrata and terminated at a depth

of at least 70 cm. Gravels and bedrock prevented some auger tests from reaching this depth. A 3 inch wide auger bucket used. Sediments were screened through 1/4 in mesh. All auger tests were backfilled.

Shovel Test Probes (STP) Shovel testing was conducted at two of the four sites (5LA4417 and 5LA3333) to sample the depth and nature of underlying sediments and to help determine the horizontal extent of artifact distribution. Shovel testing was conducted under the guidelines specified in the PCMS field and laboratory manual (Dean 1992). STPs were placed four meters apart along straight lines. The average diameter of the STPs was 35 cm. Each STP was excavated to culturally sterile substrata or to 70 cm below ground surface (bgs). Shovel testing was terminated when sterile substrata were encountered or at a depth of 70 cm bgs. Gravels and bedrock prevented some shovel tests from reaching a depth of 70 cm bgs. The sediments were screened through $^1/_4$ inch wire mesh; all artifacts were collected. STP data, which included diameter, depth, materials recovered, and stratigraphic description, were recorded. All STPs were backfilled.

Test Units Test unit excavations generally followed the guidelines set forth by Dean (1992). Modification of these guidelines occurred as field conditions dictated. Excavation units were selectively placed at each site. In most cases, test units were placed within or adjacent to visible surface structures/features to determine function and/or possible association with a use surface. Test unit placement also took into account information from various sources including geophysical survey, shovel and auger test results, surface artifact distribution, feature investigations, and surface stability. As a rule, test units were 1 m x 1 m in size. Sometimes test unit size varied so as to accommodate testing within features. Larger test units were used for testing geophysical anomalies and large features and structures.

Test units were identified by assigning consecutive numbers as excavations began on each new unit. Vertical control consisted of excavating in arbitrary 10 cm levels within identified stratigraphic layers (natural or cultural). If a natural layer was greater than 10 cm thick, it was leveled off at an initial maximum depth of 10 cm before the next arbitrary level began. This continued until excavation ceased or a layer change was observed. In a few instances, levels were expanded to 20 cm when less control was needed. As a general rule, vertical levels were excavated horizontal to the ground surface. At all sites, test units were set to magnetic north and the four corners of each test unit were mapped with the Total Station. Excavations began at the ground surface of the highest corner unless an impediment prevented using this corner. If this was the case, this information is provided in individual site chapters. The elevation of the test unit datum corner was shot in with the total station and this is referenced as meters below or above the arbitrary site datum elevation of 100 meters. During excavation all references were to depths below ground surface (bgs), meters below main site datum (mbsd) or, in a few cases, meters above site datum (masd). All test units were backfilled.

Test unit excavations were terminated when culturally sterile strata were reached or when sufficient data had been collected to determine a features nature and possible function. Recovered artifacts and samples from the surface and subsurface were transported to the Department of

Anthropology at FLC for additional laboratory analysis and cataloging.

Test units were excavated using picks, shovels, and hand trowels. In some cases when a higher degree of control was needed ice picks and brushes were used. Sediments from all units were screened through ¼ inch wire mesh. Artifacts collected from each level were assigned unique field specimen numbers. Artifacts found *in situ* were mapped in place and assigned an additional point provenience designator. A 1/9 control sample of unit fill from each level or layer in each test unit was retained for water screening in the field laboratory. Control units were placed in the northwest corner of the test unit; however, in cases where removal of fill from the northeast corner was obstructed, control units were placed in an alternate corner. In the case of contiguous test units measuring 2 m x 2 m, similar- sized control samples were retained from all four corners, preserving the ratio. All of the fill from two features, a hearth at 5LA6108 and a thermal feature at 5LA4417, was collected for flotation samples and processed in the FLC archeological lab. Soil samples were collected from all strata from test unit profiles.

Field Recording Data from field work were recorded on the appropriate PCMS forms. Ancillary FLC forms were used for field specimen inventories, stratigraphic descriptions, and photographic descriptions. Black-and-white photographs and digital photographs were taken throughout. Photographs were taken of at least two profile walls from each excavated test unit. Site and feature overview photographs were taken as well.

In accordance with Dean (1992), stratigraphic profiles were drawn of at least two walls of each test unit. Stratigraphic information recorded included pedogenic structure, Munsell color, soil texture, inclusions, reaction to hydrochloric acid, evidence of burning, soil horizon designation, percentage of gravels, stratum thickness, and evidence of cultural features or artifacts. Several terms were used throughout the field recording to delineate the stratigraphic units. The nomenclature adopted in the field was carried over into the report descriptions. These terms are defined below.

Layer A stratigraphic unit, usually horizontal and often defined in profile, consisting of similar sediments containing evidence of human occupation, and usually consisting of *in situ* or *de facto* deposits representing fill within features. Layers were determined during excavation and, therefore, do not always cohere with those defined after excavation and during stratigraphic designations.

Level Arbitrary unit of excavation, usually 10 cm.

Stratum A stratum is a distinctive body of sediments or bedrock that is differentiated from overlying, underlying or adjacent strata on the basis of physical appearance. A stratum is usually horizontal and often defined in profile. Often, but not always, it consists of sediments lacking evidence of human occupation. Strata are numbered sequentially from top to bottom and are usually consistent across the site. They can vary in thickness and geographic extent but must be mappable or traceable for long distances, usually beyond the boundaries of the site.

Ethnostratigraphic Unit A unit of cultural material whose artifacts must be only those artifacts whose age of manufacture or use is contemporaneous with the age of deposition of the stratum. In other words, the cultural material must be *in situ* and dated to the same time period as the sedimentary deposit (Stein).

Soil Horizon A layer of soil material, approximately parallel to the land surface, that has been altered in place from pre-existing sediment by physical, chemical, and biological processes occurring near the surface.

Test unit descriptions typically include a discussion of the stratigraphic layers identified during excavation and the corresponding strata designations defined in profile. This division was retained in this report to preserve the specific data recorded in the field. Correlations among layers, strata, and soil horizons were made whenever possible.

Field Artifact Analyses

All diagnostic surface artifacts (historic and prehistoric) including modified glass, portable groundstone, flaked tools, and bifaces were collected. Field artifact analysis was conducted on flaked lithic debitage and non-portable groundstone. The procedures for the field analysis are described below.

Flaked Lithic Debitage Analysis of the surface flaked lithic debitage follows Ahler (1989) as described by Owens et al. (2000:17-22). Ahler's method for mass analysis of flaking debris emphasizes size-grade distributions of raw material types and is based on the assumption that earlier stages of lithic reduction produced larger flakes, while later stages produce greater numbers of smaller flakes. Flake characteristics are used to infer stages of reduction, i.e. initial core reduction to final tool production. The assumption that higher percentages of simple flakes occur during the early to middle stages of reduction activities is inherent in this analysis. Complex flakes occur during middle stages of reduction, the first half of shaping and tool production, but are more common in later stages of reduction, the last half of shaping and tool production of unifacial and bifacial tools. These basic premises are in part based on experimental data reported by Magne (1985). Experimental studies by Ahler (1989) on samples of Knife River Flint suggest that bifacial thinning flakes are associated with later stages of bifacial reduction, but are rare or absent in other technologies and reduction stages (Ahler and Smail 1999).

Other flake attributes included recorded flake type, presence or absence of cortex, size, and raw material type. Four categories of flaking debris (flake type) were recognized: shatter, simple flake, complex flake, and bifacial thinning flake. These flake types are defined below and follow the definition of Ahler (1989, 1996).

Shatter is a generally angular piece of flaked and flakeable stone that lacks any feature which allows for determination of dorsal or ventral surfaces or any determination of direction of force reduction. A simple flake is a freehand percussion or pressure flake that exhibits parts of no more

than two previous flake scar facets on the dorsal surface (exclusive of small platform trimming/shaping flakes). A simple flake may or may not retain the platform. A complex flake is a freehand percussion or pressure flake that lacks the specialized features of a bifacial thinning flake but which retains all or parts of three or more previous scar facets on the dorsal surface (exclusive of small platform trimming/shaping flakes). Complex flakes may or may not retain the platform. A bifacial thinning flake is a technologically specialized flake removed from a biface during mid to late stages of thinning. Bifacial thinning flakes retain a combination of most of the following attributes: a platform, which is a fragment of a bifacial margin (linear and faceted); lipped platform; flat, very thin cross-section (transverse and longitudinal); feathered, low-angle lateral margins and termination; slight curvature in longitudinal section; multiple dorsal scars; dorsal scars, which converge from different directions; and little or no cortex.

Flakes were size-graded with the aid of small hand-held screens. Flakes greater than 1 in were classified as Grade 1. Flakes greater than ½ in and less than 1 in were classified as Grade 2. Flakes greater than ¼ in and smaller than ½ in were classified as Grade 3 and flakes smaller than ¼ in were classified as Grade 4.

Material type descriptions are based on those classified by Andrefsky (1988) and redefined by Ahler (1996). Material types identified in our sample include the following: basalt/hornfels, chalcedony, chert, orthoquartzite, obsidian, quartzite, silicified wood, and siltstone. All of these material types, except obsidian, are reported as occurring locally on the PCMS (Ahler 1996: 339-355).

Groundstone Groundstone artifacts were categorized as portable or non-portable. Portable groundstone, such as manos, were collected for laboratory analysis. Non-portable groundstone artifacts were recorded and left in the field. The field analysis was designed to emphasize morphological variability, anticipating that such variability will reflect changing temporal trends in groundstone utilization. It establishes condition (completeness), type (raw material type and morphology), form of the grinding surface, shaping (preparation or modification), size (maximum length, width, thickness), and characteristics of each grinding surface. This includes the surface size, shape, presence and direction of striations and the presence of polish, pitting/pecking, and smoothing.

Laboratory Methods and Techniques

During the field season, temporary field laboratory facilities were located at Red Rocks Canyon Ranch, PCMS (July through August). All subsequent laboratory work was conducted at the lab facilities at FLC. Laboratory methods follow the guidelines for required procedures established by Dean (1992) for work conducted at PCMS and modifications to Dean (1992) as set forth by DECAM (2003). Adherence to these guidelines insures that data collection is compatible with previous archeological research conducted at PCMS. All recovered artifacts/materials were inventoried and recorded on PCMS/FCMR Transaction Logs. The artifacts were cleaned according to conservation procedures, then rebagged and labeled as outlined in Dean (1992) and by DECAM

(Pam Cowen personal communication 2003). Personnel from FLC analyzed the flaked lithic artifacts, groundstone, nonhuman faunal remains, and historic artifacts. Additional laboratory analyses procedures are discussed below.

Samples

The control samples collected from each excavation level were wet screened in the field laboratory. These control samples were used to recover smaller cultural material normally lost during dry screening with ¼ in mesh. The wet screened samples were processed through 1/16 in mesh, air dried, and sorted. Feature fill collected for flotation samples was processed at FLC with a flotation device. Both light and heavy fraction materials were air dried, then sorted. Macrobotanical, gastropod, and charcoal were collected from both processing methods. Selected samples were submitted to High Plains Macrobotanical Services in Laramie, Wyoming, for identification and analysis. The results of this analysis are presented in Appendix II. Charcoal collected in the field and from the control samples for C^{14} dating were submitted to Beta Analytic Inc. in Miami, Florida, for radiocarbon dating (Appendix III). Soil samples were collected for further soil/sediment textural division. Selected samples were sent to Colorado Analytical Laboratories, Inc. In Brighton, Colorado, for analysis (Appendix IV). The samples not sent to Colorado Analytical Laboratories were processed at FLC using soil separation tubes manufactured by the LaMotte Co. This further testing of textural properties is reflected in the descriptions of strata for each test unit and sometimes diverges from textural divisions made in the field.

Flaked Lithic Artifacts

For analysis purposes, collected lithic artifacts were divided into flaked lithic debitage and tools. The debitage were analyzed the same as debitage recorded in the field. The reader is referred back to the section under field artifact analysis for a description of the steps involved in this analysis. For coding purposes, which differs from the field analysis, the flaked lithic artifacts were divided into the following categories: biface, flake tool, core, broken, and unbroken debitage (Dean 1992). Analysis of the flake tools and the raw material types conforms to the classification system developed by Stan Ahler and defined in Owens et. al. (2000:17-21). In this system lithic tools are categorized according to the following techno-morphological classes.

Patterned Flake Tools

Biface A biface is a patterned tool with generally shallow-angle retouch on both faces. Both complete and fragmented bifaces were weighed and measured whenever possible. Techno-morphological classes of bifaces are as follows:

Small, thin-patterned bifaces are bifaces that have been heavily shaped by intentional secondary flaking (patterned), are small and thin in size and form (e.g. arrow point), and exhibit only pressure flaking. This class includes both technologically finished and unfinished forms.

Large, thin-patterned bifaces are defined as bifaces heavily shaped by intentional secondary flaking (patterned), medium to large in size and form (e.g. dart point), and shaped by pressure flaking and/or percussion techniques with highly regularized bifacial margins. This class includes both technologically finished and unfinished forms.

Other large-patterned bifaces include large, thin bifaces that lack hafting elements and may have been used as hand-held cutting implements. This class includes both technologically finished and unfinished forms.

Projectile Point Projectile points compose a portion of the biface assemblage and are distinguished by the presence of a haft element. Descriptive terms for morphological attributes of projectile points were adapted from Lintz and Anderson (1989). Measurements for neck width, neck length, neck height, haft length, and base width were made whenever possible. The collected projectile points were compared to Lintz and Anderson (1989), Loendorf et al. (1996), Loendorf and Loendorf (1999), Owens et al. (2000), and Schiavitti et al. (2001).

Diagnostic attributes, including overall size and hafting morphology (stemmed or flanged, base shape, tang, and shoulder characteristics), provide a means to visually compare projectile point types and to determine similarities with published types. As with all nonstatistical projectile point comparisons, the results are somewhat subjective. Based on morphological similarities with projectile points from dated contexts, relative dates were assigned to the points whenever possible. All projectile points were examined to establish a baseline date or to add to an existing one. Other data were used to assess site dates, such as the presence of ceramics, structures, and perhaps more importantly, radiometric dating.

Flake Tool Flake tools exhibit both patterned and/or unpatterned modifications in the form of intentional retouch and/or utilization damage. Techno-morphological classes of flake tools include patterned and unpatterned. A patterned flake tool is defined as a flake tool with secondary flakes removed to produce a form or outline intended by the knapper (e.g., end scraper). An unpatterned flake tool is defined as a flake tool with one or more edges macroscopically modified by intentional retouch and/or utilization damage. The outline of these tools is largely a product of the flake blank shape rather than intentional retouch. Both complete and fragments of flake tools were weighed. The amount of cortex present was identified along with the degree of retouch and utilization observed.

Core Cores consist of any core or core-like tool produced by freehand (non-bipolar) percussion flaking. These artifacts sometimes exhibit intensive battering along the ridges between flake scars. Cores and core tools were weighed and the amount of cortex present was noted. The number of striking platforms and flake scars were identified along with the presence of use wear.

Groundstone

Groundstone analysis of the collected specimens was similar to that described for the non-portable groundstone (see field analysis with the addition of edge grinding). Some of the recorded

attributes are only applicable to specific groundstone types. For example, the presence of a keel and battering for manos. Only the complete groundstones were measured.

Faunal Remains

Faunal remains were analyzed by Cerisa Reynolds of FLC. The faunal collection housed at FLC was used as the comparative collection. Because of the diverse faunal assemblage collected from the four sites, other resources were used to aid in identification of remains and are detailed in full in Appendix I. In accordance with Dean (1992), faunal remains were first separated according to those which could be identified and those that were too fragmented for identification. Whenever possible, recorded attributes include taxon, common name, element, side, portion, completeness, weight, length, breadth, height, depth, presence of burning, modification, and age.

Upon completion of the analysis, the identified elements were quantified using minimum number of individuals (MNI) (Grayson 1984) and number of identified specimens (NISP) (Grayson 1984; Klein and Cruz-Uribe 1984).

Historic Artifacts

Historic artifacts were analyzed according to the guidelines set by Dean (1992). Historic artifact categories include metal, ceramic, leather, rubber, glass, textiles, and shell. The metal artifact category is composed of tin cans, cartridge casings, wire, nails, and miscellaneous metal items. Porcelain and whitewares make up the ceramic category. Glass artifacts were separated according to bottle and non-bottle glass. Non-bottle glass includes flat glass (window pane), chimney glass, and unidentifiable glass fragments. References were consulted to identify manufacture dates based on maker's marks and/or other datable characteristics.

Cataloging and Database Management

Catalog numbers were assigned to individual or groups of artifacts/materials according to analytical units defined by the coding process. Procedures for cataloging were established by DECAM Curation Facility, Fort Carson (Pamela Cowen personal communication 2004) and are structurally similar to those provided by Dean (1992). The catalog number consists of two components, the Smithsonian site number and the catalog extension. In order to keep all sites in numeric order within the database a zero (0) is placed after the county designation in the Smithsonian site number. This is a practice unique to the Fort Carson cataloging system and is enforced only in the context of database information. The catalog extension is a sequential identifier assigned to artifacts found on particular archeological sites. It is composed of a decimal point followed by three digits, and another decimal point followed by three additional digits. Using this cataloging sequence, the first artifact recovered at site 5LA5612 would receive the catalog number 5LA05612.000.001. The catalog extension is read as a number from 1 to 999,999. The decimal point is used simply as a placeholder.

Data collected on PCMS forms were entered into Microsoft Access. Within the database, artifacts were separated into individual tables according to the transaction logs defined by Dean (1992). Each transaction log was linked to a master table by the catalog number that was created for each entry. The master database fields were dictated by the PCMS curator. This information is available to PCMS and the US Army in electronic and hard-copy formats.

CHAPTER 6
SITE 5LA3333

Introduction

5LA3333 is located on the Doss Canyon North 7.5' United States Geological Survey quadrangle (Figure 6.1) at an elevation of 4995 ft (1522 m) above sea level (asl). This 10,846 m² (2.68 acre) site is on the rim of a low terrace above a small, unnamed intermittent drainage and spring. The spring is located in the southwest portion of the site at the head of an easterly trending drainage that flows into Lockwood Arroyo. A smaller fork of the drainage joins the larger drainage in the southern portion of the site. Pockets of soil and sediments are interspersed among outcrops of the sandstone bedrock (Figure 6.2). A two-track road crosses the drainage west of the site. The road divides and continues to the north and east. The ground surface to the east of the protective site fence, but within the actual site boundaries, is disturbed by tracked vehicular maneuvers.

The site was originally recorded in 1984 by the University of Denver (DU). Based on the architecture and the artifacts, the site was determined to be a ranching operation of Euro-American/Hispanic origin. The historic occupation of the site was dated to 1870 - 1940 (Angulski and Carrillo 1984). A sparse prehistoric component of unknown age was also noted. Four historic structures (Structures 1 - 4), two probable historic features (Features 2 - 3), and one bedrock metate (Feature 1) were recorded. At this time, the research potential of the site was considered to be low. Some further testing was recommended, especially in Feature 2 (Angulski and Carrillo 1984). The site was revisited in 1985 to assess the historic and architectural integrity of the recorded structures. This assessment concluded that the structures did not possess sufficient physical integrity or significance to warrant an architectural nomination to the NRHP (Haynes and Bastian 1987).

When the site was recorded in 1984 a sample of historic artifacts was collected from the surface. All artifacts from within and surrounding Feature 2, Structure 2, and Structure 4 were collected, as were all cultural materials from two artifact concentrations. The collected artifacts included: 48 pieces of clear window glass, 20 cans, 48 historic ceramics, 56 pieces of bottle/jar glass, and some stove parts. The cans consisted of ten sanitary food cans with cut-out lids, seven church key opened beer cans, two key-opened food cans or tins, and one baking soda/powder can with a slide-on lid. The majority (46) of the ceramics were from a plain whiteware bowl(s) with a maker's mark that was not further discussed in the site form. The remaining two ceramics were also plain whitewares but were from a plate or saucer with a relief-molded design. The 56 pieces of bottle/jar glass included 30 pieces of clear glass, 21 pieces of aqua glass, and 5 pieces of solarized glass. Three pieces of clear glass and three pieces of aqua glass were identified as coming from a canning jar. One clear glass base fragment had the manufacturer's mark from Kerr Glass Mfg. Co. The remaining glass artifacts had no other distinguishing features.

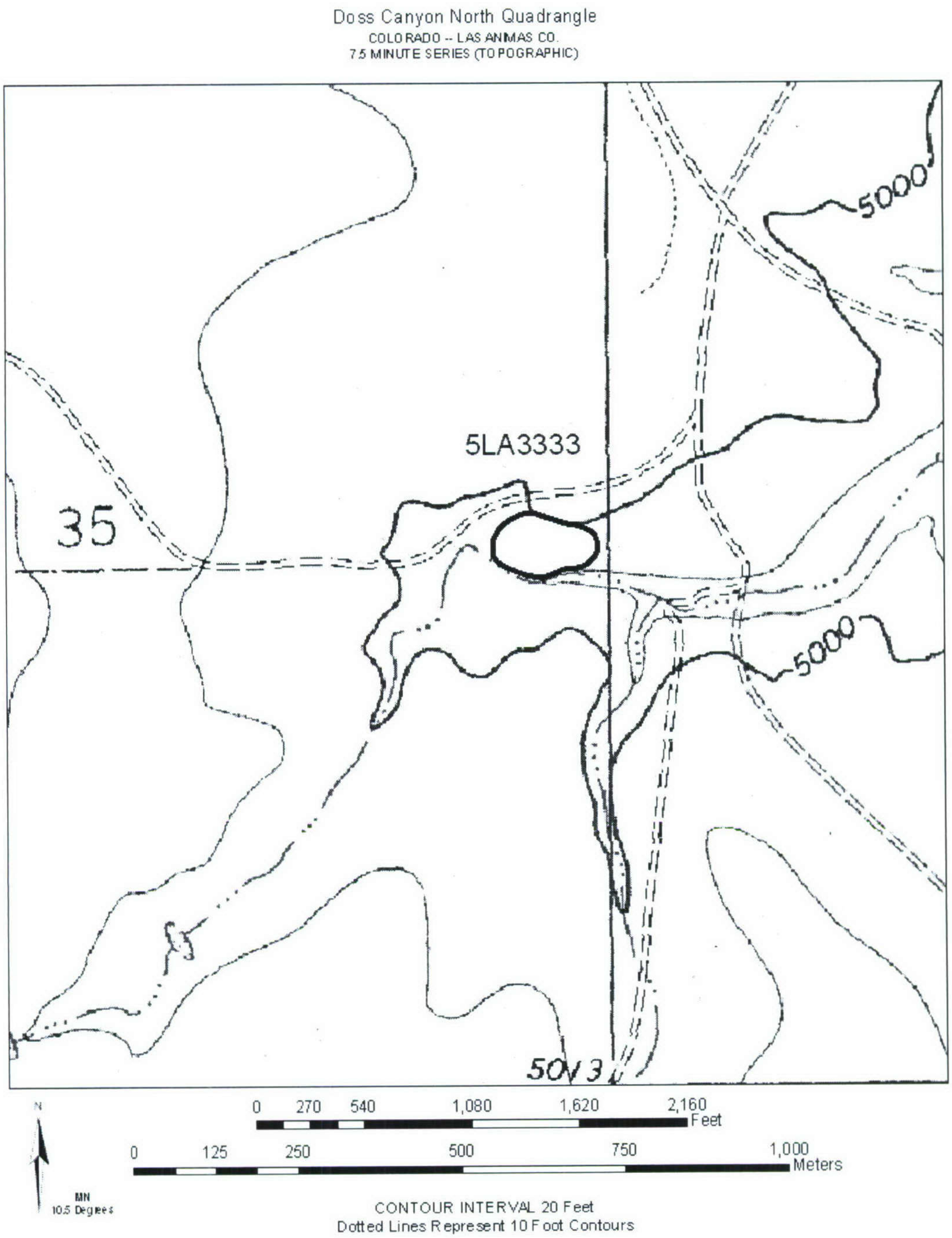


Figure 6.1. Location map, 5LA3333, PCMS.

In addition to these historic artifacts, seven flake tools, eight lithic flakes, one hammerstone, one mano, two cores, and six core fragments were point plotted and collected by DU. Although the area around the spring was dry in 2003, standing water approximately 0.5 m (20 in) deep was observed in 1984.

Figure 6.2. Site overview, 5LA3333. View is to the east down the intermittent drainage.

Surface Investigation

The 2003 site investigation began with a pedestrian survey. All features, structures, diagnostic historic artifacts. and all prehistoric artifacts were pin-flagged. Because the original site datum could not be relocated, a new main site datum was set in a location that provided good visibility of the entire site. The main site datum, marked by a piece of rebar, was set at 100mN, 100mE, at an arbitrary elevation of 100 m. A topographical map that included the site boundary, all structures/features recorded in 1984, and all newly identified features and structures was created using the Total Station (Figure 6.3). All of the originally identified structures (1 - 4) and features (1 - 3) were relocated during reevaluation of the site by FLC. One additional historic architectural structure (Structure 5) and six additional features (Features 4 - 9) were also recorded. Tracked vehicular disturbance and the distribution of both historic and prehistoric artifacts were also mapped. Historic artifacts mapped but not collected include stove parts and other decorative metal. Three pieces of modified glass were mapped and collected from the surface.

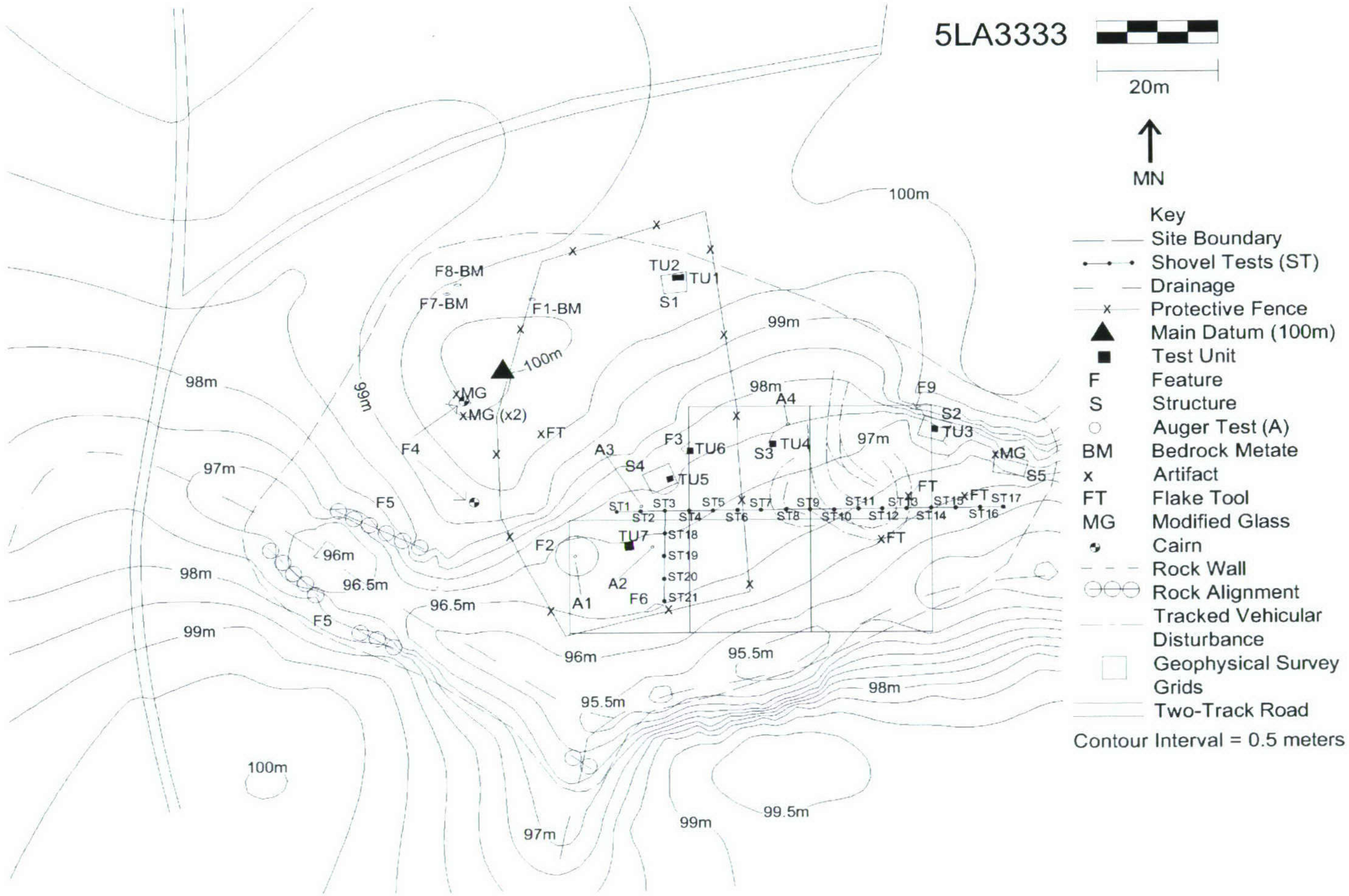


Figure 6.3. Site map, 5LA3333.

The prehistoric component consists of three bedrock metates, one possible wall alignment, a rock art panel, and a light scatter of lithic debitage and flake tools. Lithic artifacts were located primarily in deflation pockets within bedrock exposures and along the alluvial terrace. Twenty-two lithic flakes were mapped and field analyzed but were not collected. Four lithic tools were collected from the surface. A small rock art panel to the west of Structure 2 along an outcrop of sandstone bedrock was also recorded. The historic structures and historic and prehistoric features are described below.

Structures and Features

Structure 1

Structure 1 is a dry-laid sandstone foundation approximately 4.4 m (14.4 ft) east/west, 3.8 m (12.5 ft) north/south, and 0.3 m (1 ft) high at its maximum (Figure 6.4, Figure 6.5). Only the foundation stones remain in place. In 1984, the structure was identified as a Hispanic structure important to the history of the PCMS. This identification was based on three characteristics: the placement of a possible hearth in the northeast corner, a south-facing doorway, and a low number of artifacts (Angulski and Carrillo 1984).

Figure 6.4. Structure 1, 5LA3333. View is to the east.

Structure 2

Structure 2 consists of a stone foundation and wall fall from three walls that abut a 1.5 m tall sandstone outcrop that forms the structure's north wall (Figure 6.6). Structure 2 is outside of the present protective fence. Originally identified as a stone structure with a possible fireplace in the southeast corner (Angulski and Carrillo 1984), the structure is constructed of dry-laid, horizontal sandstone slabs and extends 4.6 m (15.9 ft) east/west and 5.5 m (18 ft) north/south. The masonry walls reach a maximum height of 0.4 m (1.4

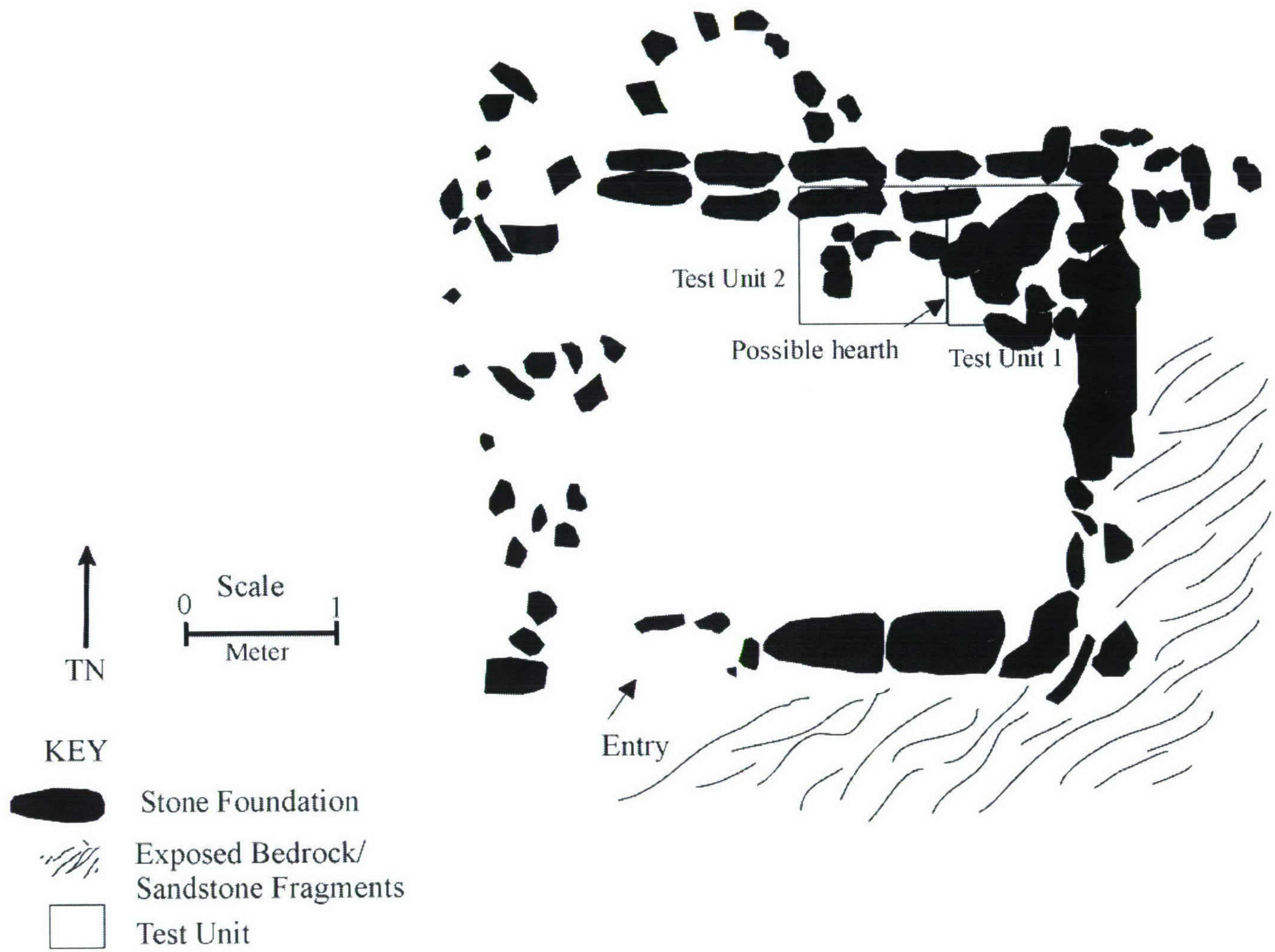


Figure 6.5. Structure 1 plan view, 5LA3333.

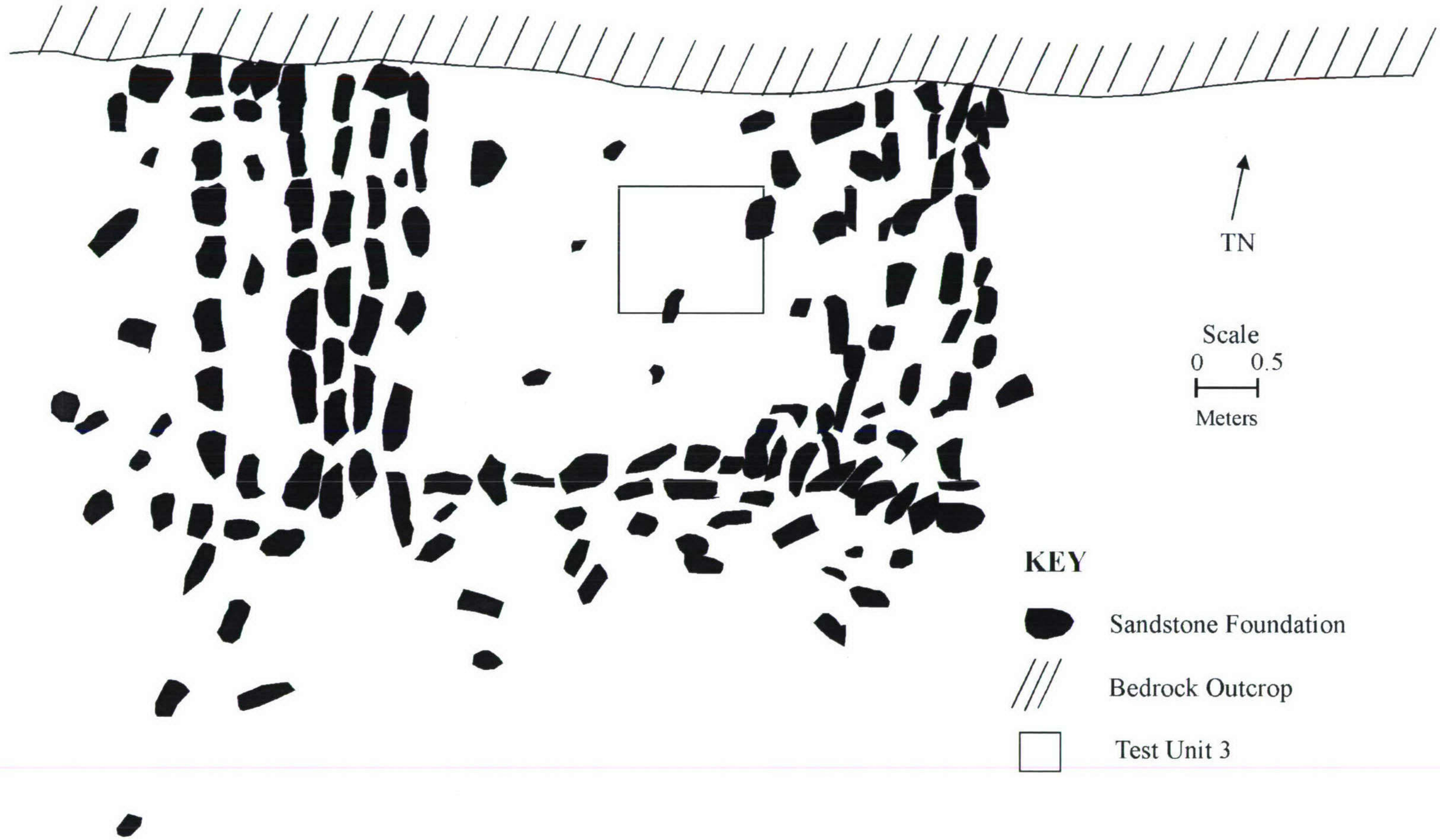


Figure 6.6. Structure 2 plan view, 5LA3333.

ft). A rock art panel on this same outcrop is immediately west of Structure 2. Bottle glass directly associated with this structure was collected in 1984.

Structure 3

Structure 3 was originally described as a set of stone piers possibly for supporting a log cabin. This structure was barely visible in 2003. It is outside of the protective fence and may have been impacted by the tracked vehicular maneuvers since it was first recorded. No artifacts were found directly associated with this structure either during the original documentation or during evaluative testing.

Structure 4

At approximately 1.1 m (3.7 ft) high and with ten visible courses, Structure 4 has the highest standing walls of any structure at the site. The original construction was completed with sandstone blocks and horizontal slabs laid with a mud mortar containing sandstone inclusions (Figure 6.7, Figure 6.8). It measures 7.5 m (24.4 ft) east/west by 4.7

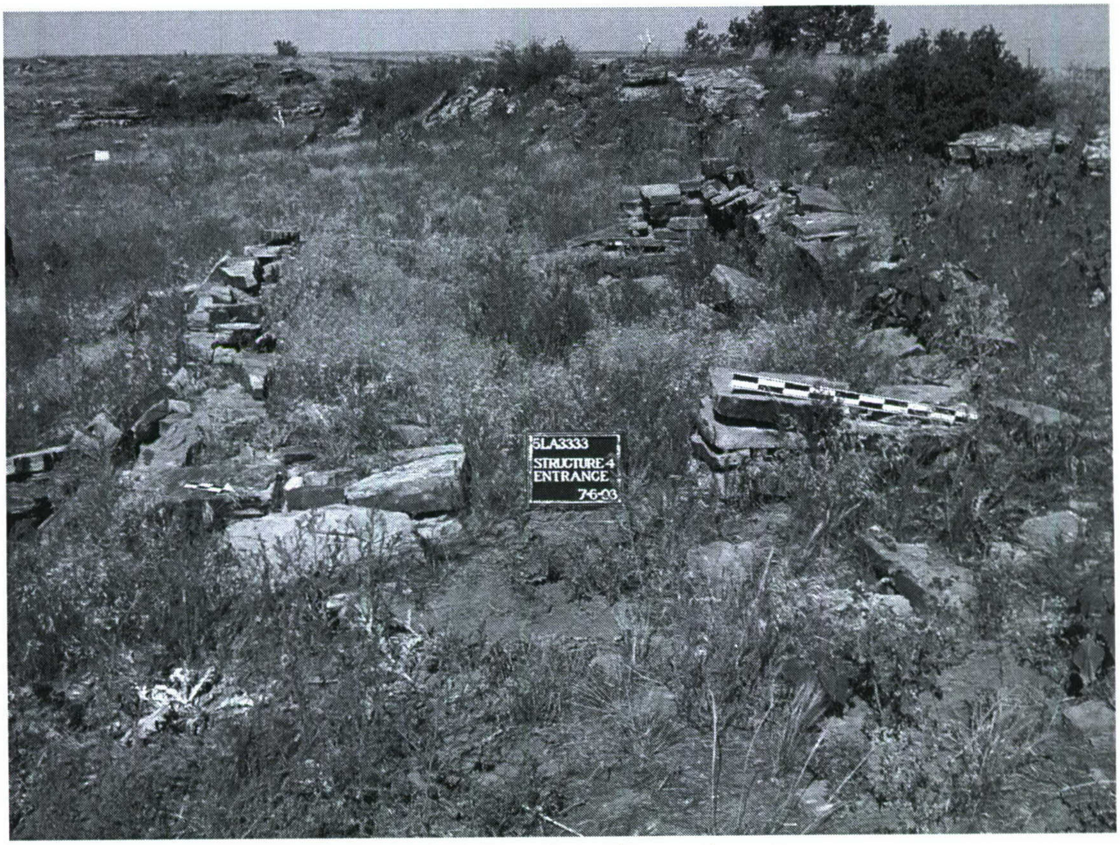


Figure 6.7. Structure 4, 5LA3333. View is to the southwest.

m (15.4 ft) north/south. The doorway is on the east side of the structure. A wooden post, just over a meter south of the southeast corner, may also be associated with the structure. In 1984, DU identified Structure 4 as a stone dwelling with no fireplace. Bottle glass, including solarized glass, directly associated with this structure was collected in 1984. A nearby concentration of bottle glass and canning jar glass was also collected.

Figure 6.8. Structure 4 plan view, 5LA3333.

Structure 5

Recorded by FLC in 2003, Structure 5 consists of a roughly rectangular foundation formed by three walls of dry-laid sandstone blocks extending from a large boulder of eroded sandstone (Figure 6.9). The boulder has broken away from a sandstone outcropping and forms the north wall of the structure. The south wall rests on a ledge of eroding bedrock. It is approximately 8 m (26 ft) to the east and along the same sandstone outcrop as Structure 2. Structure 5 measures 5.9 m (19.4 ft) east/west by 3.1 m (10.2 ft) north/south. One piece of aqua bottle glass and one metal can were observed on the surface within the walls of the structure. Structure 5 may represent the remains of a small livestock pen.

Feature 1

This feature is a bedrock metate with a rectangular, lightly ground surface measuring 44 cm by 16 cm. Feature 1 is located along the sandstone rim on the northern edge of the site and was identified in 1984 (Figure 6.3).

Feature 2

In 1984, this large depression (Figure 6.10), measuring 8 m (26.2 ft) east/west and 6.5 m (21.3 ft) north/south, was interpreted as either a dugout, small reservoir/cistern or a quarry for mortar. The feature lies less than 20 m (66 ft) to the southwest of Structure 4. Bottle glass and stove parts noted in the vicinity of Feature 2 were collected in 1984.

Feature 3

Immediately northeast of Structure 4, this feature was interpreted as a possible privy by the original investigators. The feature is marked by a loosely connected alignment of sandstone blocks in a 1.5 m (4.9 ft) by 1.5 m (4.9 ft) area. A nearby concentration of bottle glass and canning jar glass was collected in 1984.

Feature 4

Feature 4 consists of two cairns of local sandstone sitting on separate bedrock outcrops. The cairns are 18.5 m (60.7 ft) apart and run in a general north/south direction. The northernmost cairn consists of approximately seven toppled sandstone rocks. The second cairn has ten rocks, most of which are still piled. The cairns average 20 cm (8 in) in height. These cairns likely served as locational landmarks, possibly for the nearby spring.

Feature 5

Feature 5 is a discontinuous wall made of sandstone rocks built on the eroding bedrock directly above the drainage (Figure 6.11). On the northern side of the drainage, the wall is fairly continuous for 17.3 m (56.8 ft). On the southern side, the wall has gaps with four concentrated segments of rocks extending 30 m (100 ft) along the drainage. Other sandstone rocks found within the drainage and on the eastern end of the longer walls may have served as part of a dam to contain water or to control erosion.

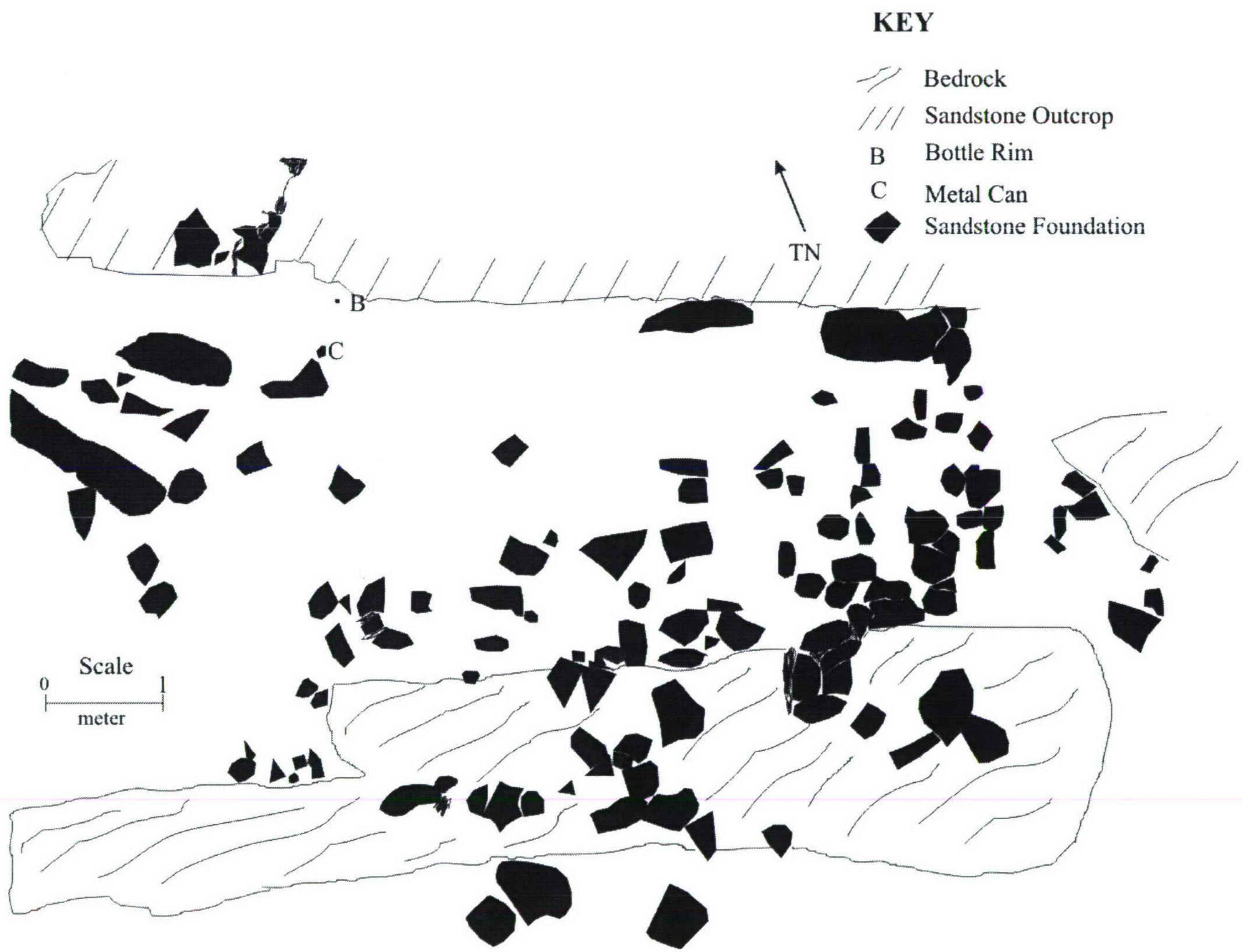


Figure 6.9. Structure 5 plan view, 5LA3333.

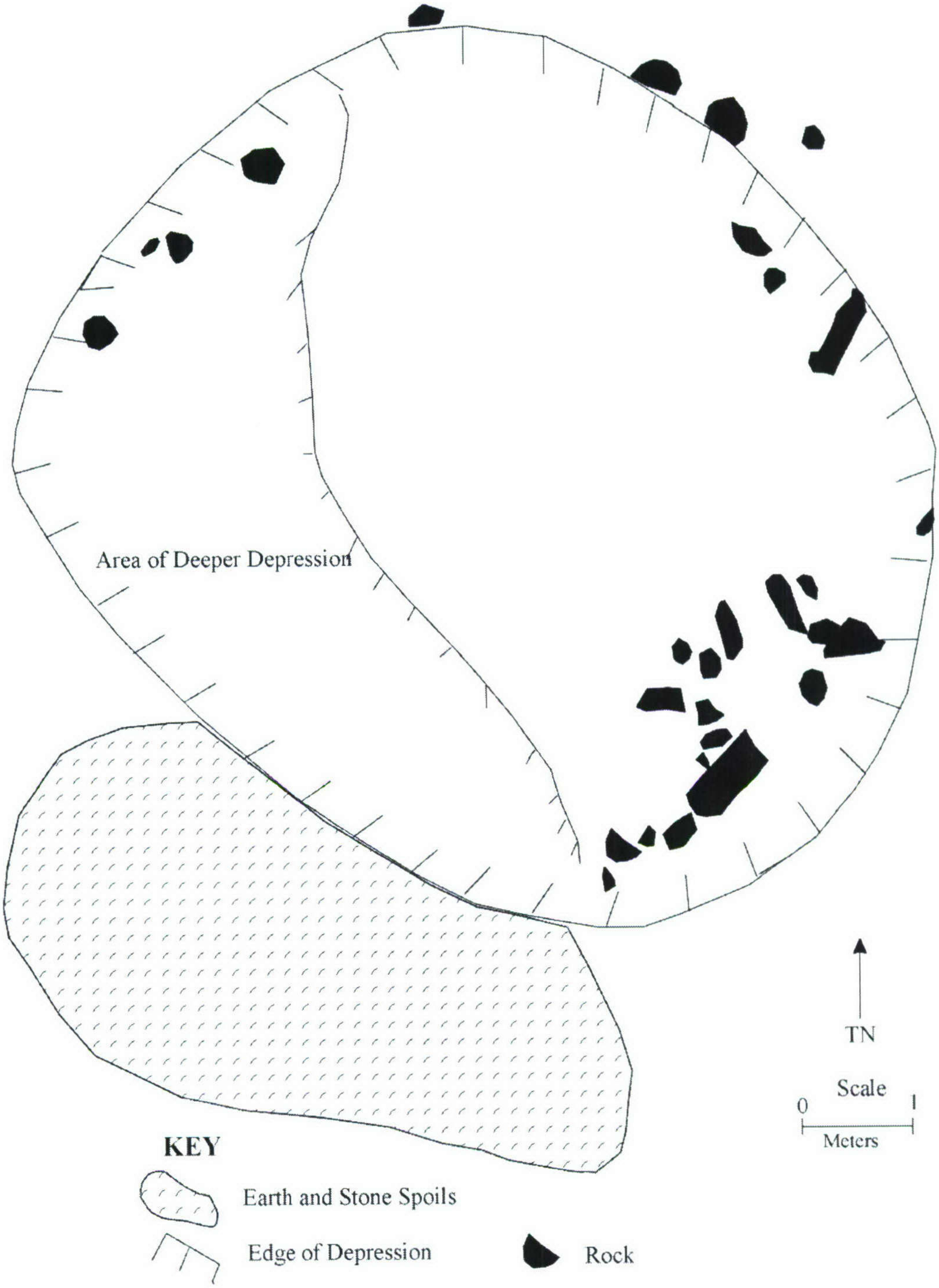


Figure 6.10. Feature 2 plan view, 5LA3333.

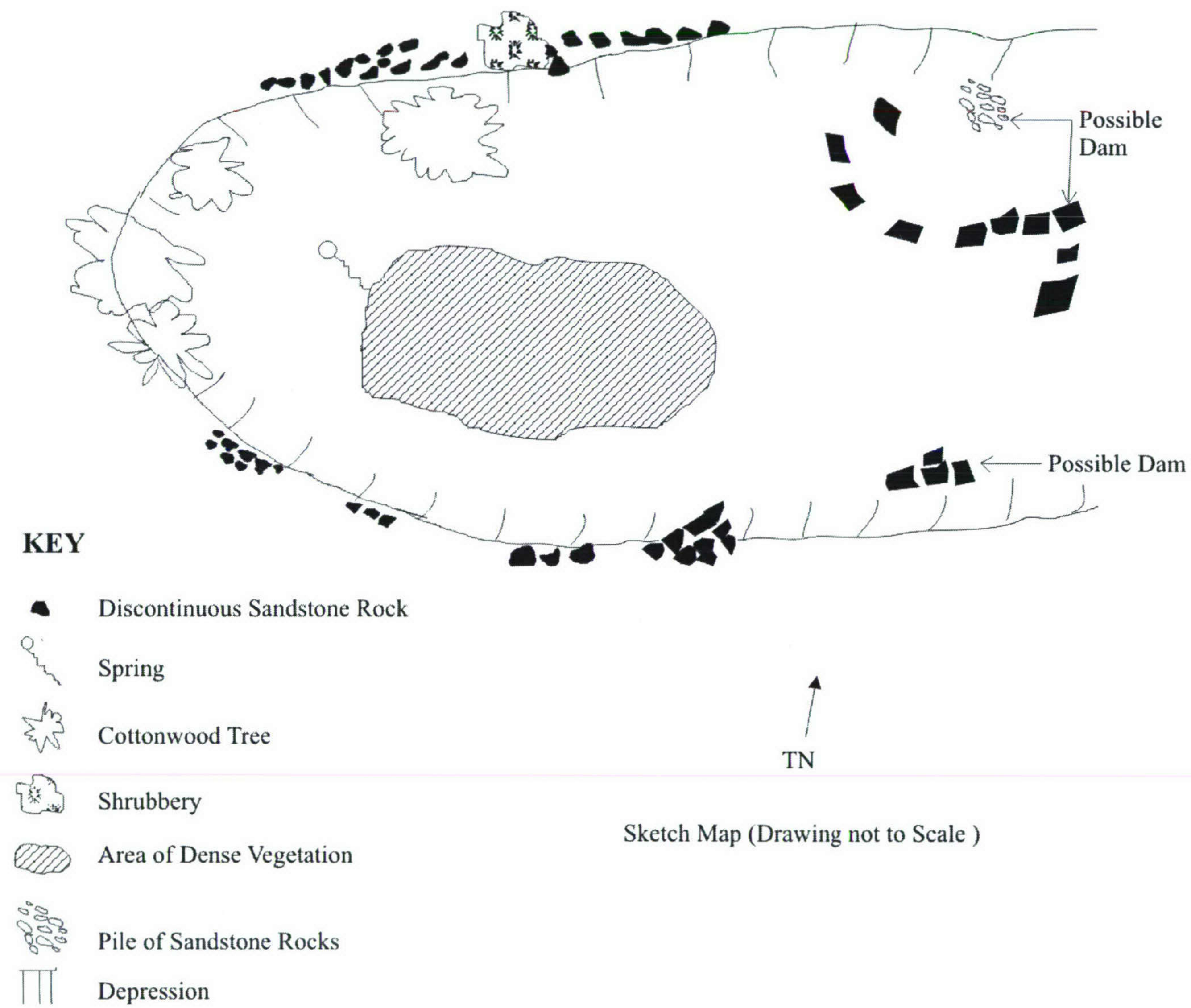


Figure 6.11. Feature 5 plan view, 5LA3333.

Feature 6

Feature 6 consists of a low, loosely stacked pile of sandstone rocks in a rough semi-circle near the south edge of the site. The feature measures 3.2 m (10.5 ft) long and 1.4 m (4.6 ft) wide. At its highest point it measures 20 cm (8 in). This may be the remains of either a prehistoric or historic structure/feature of unknown function.

Feature 7

This feature consists of a single bedrock metate located northwest of the main site datum. Two other bedrock metates, Features 8 and 9, are nearby. The grinding area on this metate measure 25 cm x 25 cm and is roughly circular with exfoliating sandstone surrounding it.

Feature 8

Feature 8 is a bedrock metate located northwest of the main site datum. Feature 7 lies approximately 3 m (10 ft) to the southwest and Feature 1 is about 10 m (33 ft) to the east on the same outcrop. The use area has an oval shape measuring 40 cm x 20 cm. The area is ground into heavily patinated bedrock.

Feature 9

Feature 9 is a rock art panel located on a sandstone face just west of Structure 2. The panel's dimensions are 2.1 m x 0.7 m (Figure 6.12). Identifiable motifs include pecked circles and lines, however, the heavy patination and damage from spalling on the outcrop make it difficult to separate some areas of pecking from natural damage.

Geophysical Survey

Electrical resistance and gradiometer surveys were conducted over five 20 m x 20 m grids to identify possible subsurface artifacts, features, or structures and to further delineate the site boundary (Figure 6.13). The grids were aligned to magnetic north.

The sample interval for the gradiometer was eight samples per meter with a one meter traverse interval. One interesting area showed in the magnetic data as a series of dipoles clustered in a 2 meter diameter (Figure 6.14). Test Unit 7 was placed over this anomaly. Another interesting area was in the southwest grid where a series of small magnetic anomalies appeared to aligned in a large circular shape. Testing in the first anomaly revealed a few large nails (perhaps recent) protruding into the ground. The second anomaly might be similar in context and may also be of fairly recent origin amd was tested. Except for isolated scatters of iron-rich artifacts and the existing fence posts, no other anomalies were identified that were worthy of subsurface investigations.

The electrical resistance survey was conducted in 1 meter traverse intervals with 2 samples per meter. There was little of interest in the resistance data except for some low resistance features in the northeast corner and scatters of low resistance anomalies in the southern half of the survey (Figure 6.15). Much of the rocky area north of the drainage

Figure 6.12. Rock art panel, 5LA3333.

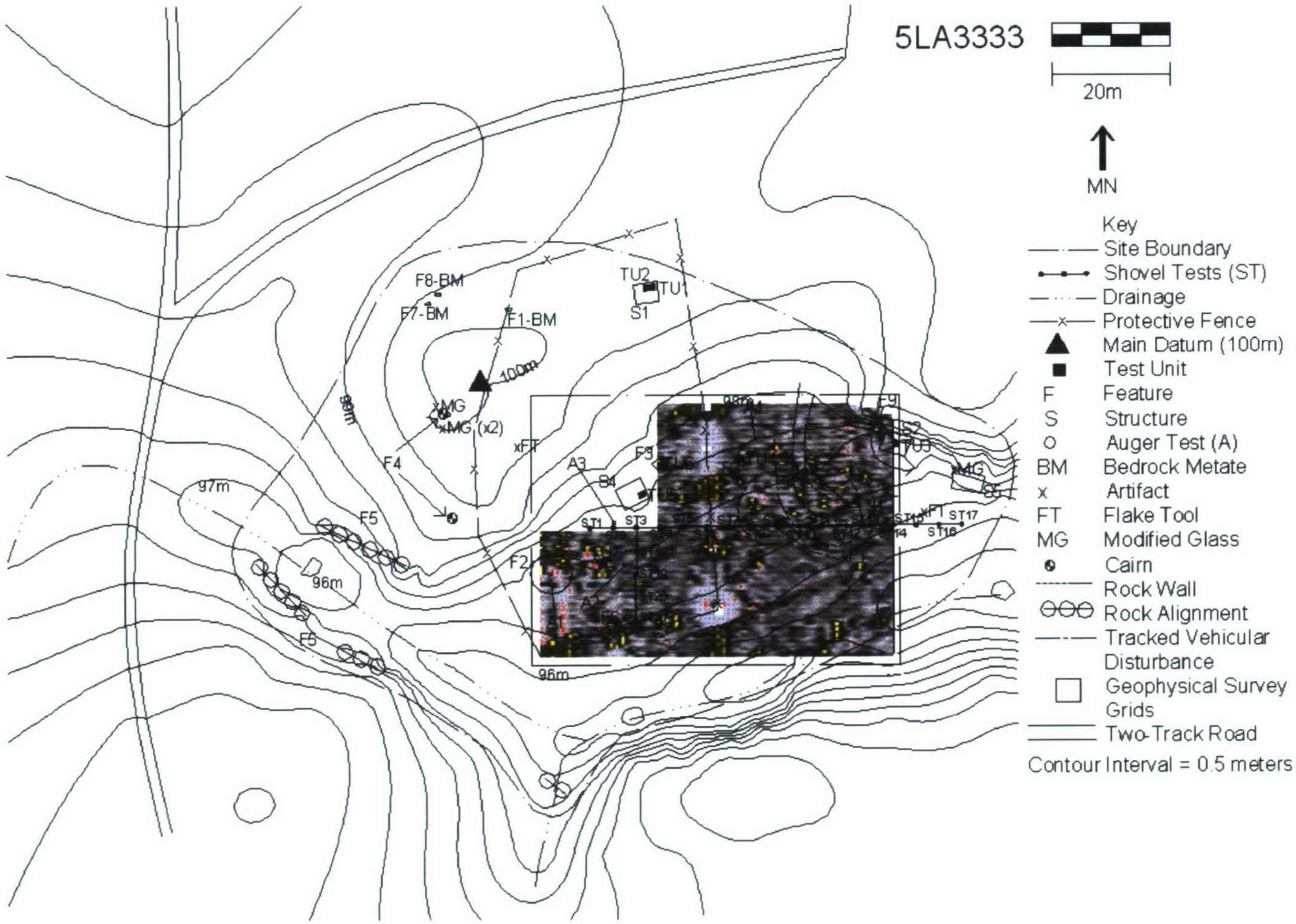


Figure 6.13. Magnetic gradiometer survey superimposed over AutoCad map, 5LA3333.

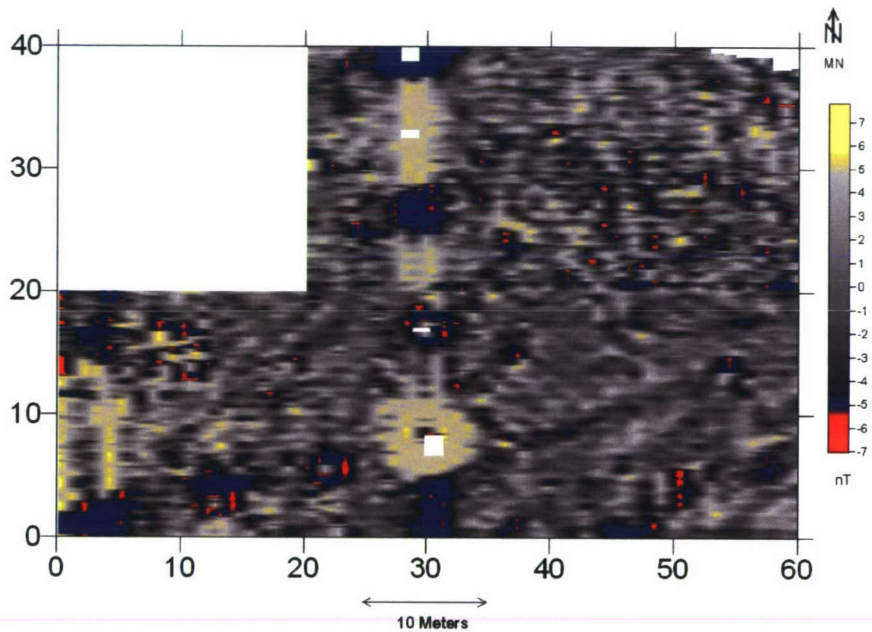


Figure 16.14. Magnetic gradiometer map, 5LA3333.

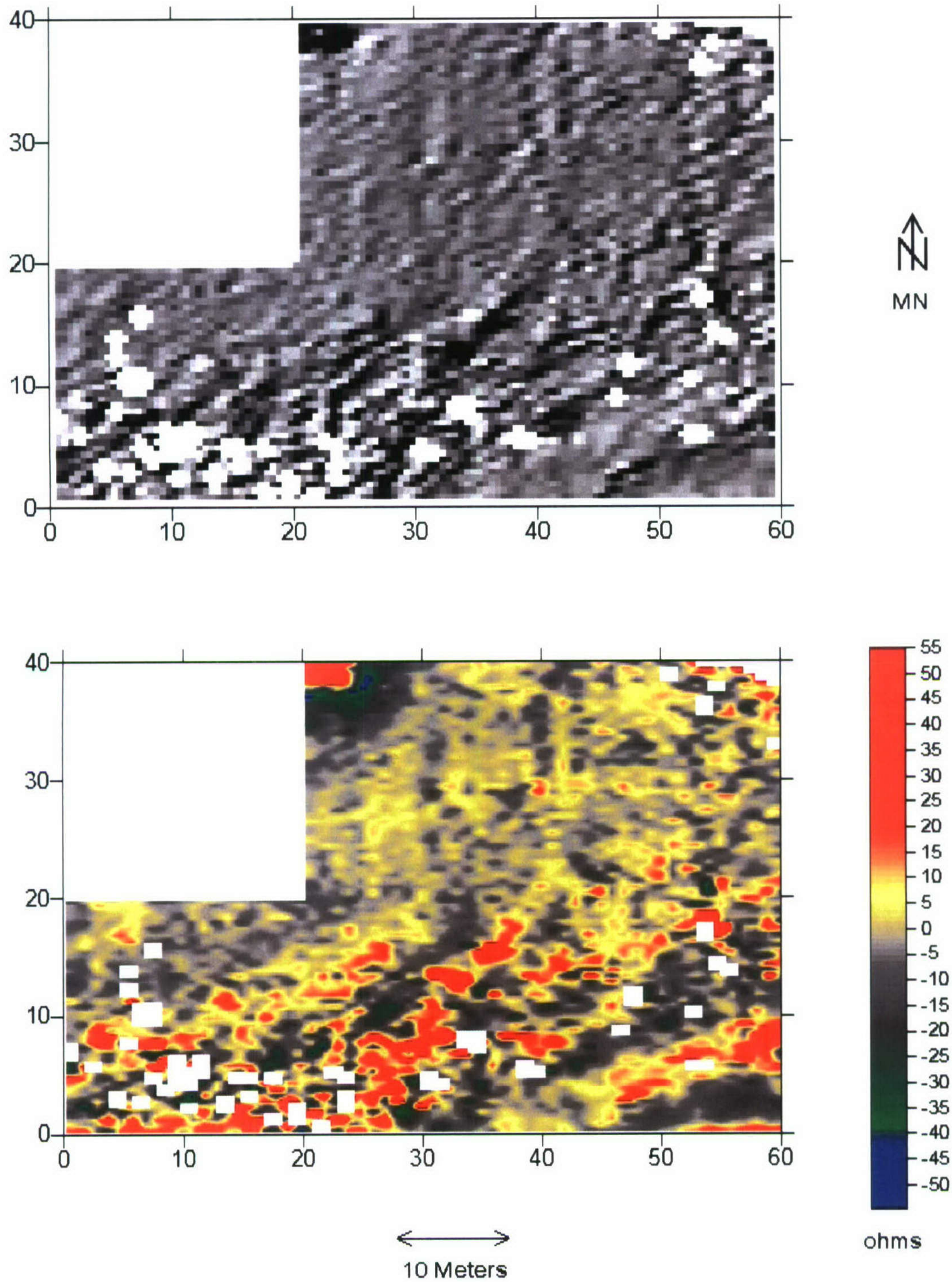


Figure 6.15. Electrical resistance map, 5LA3333.

was a hindrance to probe penetration, and this resulted in many dummy logs in the data. The tracked vehicular disturbance appear in the data as low resistance linear anomalies.

Subsurface Testing

A total of four auger test probes (ATP), twenty-one shovel test pits (STP), and seven test units were excavated to examine the extent of subsurface artifacts both inside and outside of the identified features and structures. With the exception of Test Unit 7, the test units were chosen primarily to test for the depth of material culture within the identified historic structures/features. Test Unit 7 was located in an area which revealed a magnetic anomaly during the geophysical survey.

Auger Test Probes (ATPs)

ATPs were placed in four areas to examine the sediment depth and to determine whether more extensive subsurface testing was warranted (Figure 6.3). ATP 1 was located inside Feature 2, the large depression interpreted to be either a dugout or a quarry for mortar materials. ATP 2 was placed east of Feature 2 and south of Structure 4 in an area with potentially deeper sediments. ATP 3 was located just southwest of Structure 4 to test an alignment of sandstone believed to be a possible feature. ATP 4 was placed north of Structure 3 in order to test a low resistance anomaly. Although these four auger tests revealed sediment depths ranging from 0.7 cm to 2.1 m, no artifacts were recovered from them. With no cultural material and no significant difference in the sediments as compared to the surrounding area, no further excavation was deemed necessary in these areas.

Table 6.1. Auger test probes, 5LA3333.

Probe	Max. Depth	Depth of Stratum	Stratigraphic Description	Materials Recovered
ATP 1	1.14 m	1.14 m	Pale brown silty loam, <1% gravel, moderate structure	None
ATP 2	0.7 m	0.7 m	Brown silty loam, <1% gravel, loose structure	None
ATP 3	1.58 m	1.58 m	Brown sandy loam, <1% gravel, loose structure	None
ATP 4	2.1 m	2.1 m	Brown silty loam, <1% gravel, moist after 1m	None

Shovel Tests

Two lines of shovel test pits (STP) were completed. The first line, STP 1 to 17, was placed across the site on an east/west line; the second line, STP 18 to 21, extended south from STP 3 toward Feature 6 (Figure 6.3). The shovel tests were numbered from west to east and from north to south. The deepest sediments were located in the areas of

the low resistance anomalies and the sediment depth may account for the low resistance readings. Complete information on the shovel test pits is found in Appendix V.

Table 6.2. Shovel test artifact summary, 5LA3333.

Shovel Test	Material Type	Depth below ground surface (cm)
1 - 2	None	--
3	1 metal washer	5 - 20 cm
	1 chert flake, 1 hornsfels/basalt flake	20 - 30 cm
4 - 12	None	--
13	1 horseshoe nail	20 - 40 cm
14	3 miscellaneous metal	0 - 5 cm
	1 metal wire fragment	5 - 10 cm
	1 miscellaneous metal	50 - 55 cm
15 - 17	None	--
18	1 solarized purple glass fragment, 1 aqua glass fragment	0 - 6 cm
	1 glass fragment, 1 bulk bone	6 - 20 cm
	1 chert flake, 1 chalcedony flake	20 - 40 cm
19	1 solarized purple glass fragment	9 - 20 cm
20	1 aqua glass fragment, 1 4d nail	0 - 9 cm
21	4 aqua glass fragments (1 modified), 1 horseshoe nail	0 - 10 cm

The shovel tests ranged in depth from 40 to 72 cm with an average depth of 62 cm. Six shovel tests (3, 14, 18, 19, 20, and 21) recovered historic artifacts within the first 40 cm (Table 6.2). STP 3 (located south of Structure 4) yielded lithic flakes between 20 and 30 cm while STP 18 had one bulk bone at a depth between 6 to 20 cm and lithic debitage between 20 to 40 cm below the ground surface (bgs).

Test Units

<u>Test Unit 1</u>

This 1 m x 1 m unit was placed in the northeast corner of Structure 1 where it had been previously speculated that a collapsed hearth might exist (Figure 6.5). Testing of this structure was significant because of its possible Hispanic origin (Angulski and Carrillo 1984).

The datum for Test Unit 1 was set at 117.15mN, 130.70mE, at an elevation of .16m above site datum (absd) for an arbitrary elevation of 100.16 m. Test Unit 1 was excavated in two stratigraphic layers before bedrock was reached at a final depth ranging from between 6 and 14 cm bgs. Layer 1 was composed of loose eolian sediments containing a small amount of duff and sandstone pebbles. Sources of bioturbation included short grasses, weedy roots, and insects. A layer change was indicated as sediments became more compact and the percentage of sandstone inclusions increased. No artifacts were recovered from Layer 1 which was 4 cm thick (Table 6.3). However,

several flat sandstone slabs near the bottom of the layer that had the appearance of a possible paved cultural floor surface were mapped.

Table 6.3. Test Units 1 and 2 artifact summary, 5LA3333.

Test Unit	Layer	Level	Thickness Range	Materials Recovered	
				1/4"	1/16" Control
1	Layer 1	✳	4 cm	None	1 macrobotanical sample, 1 shell sample
1	Layer 2	✳	2 - 10 cm	None	1 macrobotanical sample, 1 shell sample
2	Layer 1	✳	0.5 - 7 cm	None	None
2	Layer 2	Level 1	3 - 8 cm	1 nail	None
2	Layer 2	Level 2	0 - 6 cm	None	None

✳Excavated as a single stratigraphic layer

Layer 2 was also excavated as a single stratigraphic layer, which ranged in thickness from between 2 and 10 cm. No artifacts were recovered from this layer. The sandstone slabs mapped in the preceding layer continued. Rather than disturbing the slabs, excavation in Test Unit 1 was terminated and another 1 m x 1 m test unit (Test Unit 2) was opened adjacent to the west wall of Test Unit 1.

Test Unit 2

Test Unit 2 was placed adjacent to and west of Test Unit 1 (Figure 6.5) used the same unit datum. Two stratigraphic layers were excavated using the same datum as Test Unit 1. Layer 1 was an overburden layer consisting of loose eolian sediments held together with fine roots and including some gravel inclusions. The thickness of the layer ranged from between 0.5 and 7 cm. No cultural materials were recovered from Test Unit 2, Layer 1 (Table 6.3). Layer 2 (3 to 14 cm) was excavated in two levels and consisted of silty sediments with a high percentage of pebbles. Excavations were terminated when the sandstone slabs, which covered 90% of the unit floor, were determined to be naturally eroding bedrock. One nail was recovered from Layer 2. Test Unit 2 reached a total depth ranging from between 7 and 16 cm bgs.

Two strata were identified in the west-facing east wall of Test Unit 1, the east-facing west wall profile of Test Unit 2 and the south-facing north wall of both test units. The strata are described below (Figure 6.16).

Stratum I — Stratum I is a 2 to 8 cm thick, yellow brown (10YR 5/4), fine loam to clay loam. It is moderately compacted and single grained to platy with a clear and smooth to wavy lower boundary. The sediments are composed of 10% gravels and show a slight reaction to hydrochloric acid. The layer is bioturbated by roots. The majority of Stratum I ends at bedrock. No cultural material was recovered from Stratum I.

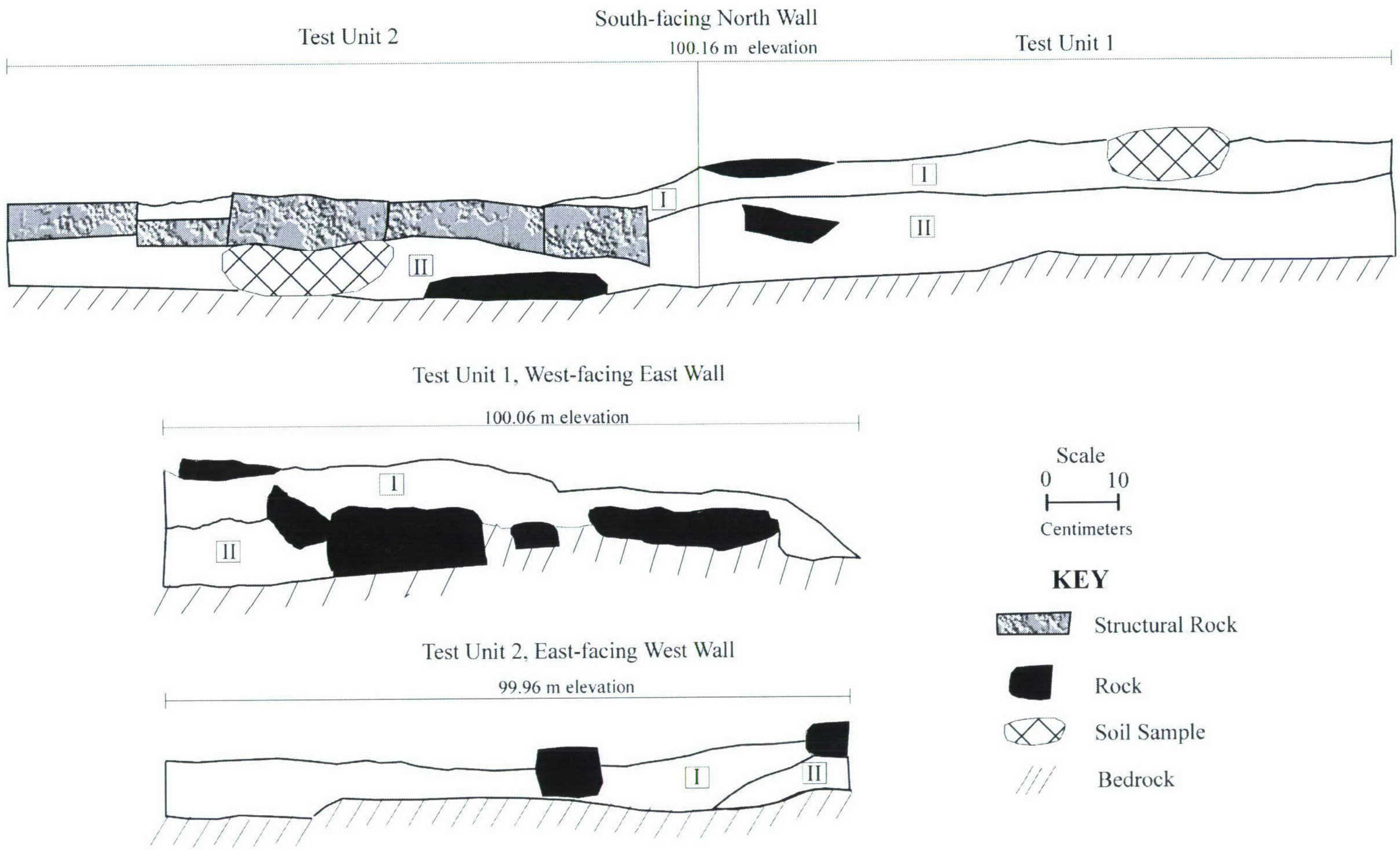


Figure 6.16. North wall profile of Test Units 1 and 2, east wall profile of Test Unit 1, and west wall profile of Test Unit 2, 5LA3333.

Stratum II Stratum II is a 2 to 12 cm brown (10YR 5/3), moderately compacted, blocky loam. The matrix is made up of 40 to 50% gravels. Sediments show a slight reaction to hydrochloric acid. Stratum II is exposed only along the northern portion of the unit and it ends at bedrock. One wire nail fragment was recovered from this layer.

What appeared, at first, to be a possible cultural surface in Structure 1 was shown to be naturally broken tabular sandstone. The slabs thought to represent a floor were found to extend below the foundation under several centimeters of sediments. No hearth was identified and only one historic artifact was recovered. Of the three critera originally proposed that might point to a Hispanic origin for this structure two remain, the low number of artifacts and the presence of a south facing doorway. Therefore, it appears more likely that Structure 1 represents the ephemeral remains of a feature associated with the historic ranching component of the site.

Test Unit 3

This 1 m x 1 m test unit was placed in Structure 2 (Figure 6.6). The north wall of the structure is formed by a ledge of outcropping bedrock. The structure lies just east of the badly deteriorated rock art panel (Feature 9) recorded during the 2003 field season. Structure 2 was thought to be a possible stone dwelling or animal enclosure (Angulski and Carrillo 1984.)

The unit datum was placed in the northeast corner of the unit at 89.99mN, 171.97mE, at an elevation of 2.52 mbsd for an arbitrary elevation of 97.48m. The control unit was originally placed in the northwest corner of the unit but was moved to the southwest corner during the excavation of Layer 3 to avoid a large rock. Test Unit 3 was excavated in three layers to a final depth of between 40 and 43 cm bgs (Table 6.4).

Table 6.4. Test Unit 3 artifact summary, 5LA3333.

Test Unit	Layer	Level	Thickness Range	Materials Recovered	
				1/4"	1/16" Control
3	Layer 1	*	3 - 5 cm	None	1 charcoal sample
3	Layer 2	Level 1	10 - 13 cm	2 glass fragments, 1 bulk bone	1 glass fragment, 1 miscellaneous metal, 1 charcoal sample
3	Layer 2	Level 2	8 - 12 cm	1 nail, 1 bulk bone	1 miscellaneous metal , 1 charcoal sample
3	Layer 3	Level 1	6 - 9 cm	1 flaked tool	1 unknown material
3	Layer 3	Level 2	6 - 10 cm	None	1 charcoal sample

*Excavated as a single stratigraphic layer

Layer 1 consisted predominantly of grasses, roots, and branches with a small amount of loose, wind blown top soil. Large and small rocks were found throughout the layer and a small amount of charcoal was collected. Layer 1 reached a thickness ranging from between 3 and 5 cm. A layer change was made as sediments became moist and blocky.

Layer 2 was excavated in two levels. The top of the layer was heavily bioturbated but this decreased toward the bottom. The presence of large rocks also decreased although there was a high percentage of smaller gravel. Large pieces of decaying wood and charcoal were also present. Glass, nails, bulk bone, and miscellaneous metal were recovered from Layer 2. Layer 2 ranged from between 18 and 23 cm thick.

Layer 3 was excavated in two levels to a thickness of 15 to 18 cm. The sediments had a high moisture content and a high amount of gravel- to boulder-sized rocks. One lithic flake was found at approximately 26 cm bgs at the transition from Layer 2 to Layer 3. No other artifacts were recovered from Layer 3. A small amount of charcoal was collected from the control sample. Excavations in this test unit were terminated after the excavation of at least 15 cm of culturally sterile sediments.

Three strata were identified in the south-facing north wall of Test Unit 3; four strata were identified in the east-facing west wall and are described below (Figure 6.17).

Stratum I — Stratum I is a 5 to 9 cm thick, brown (10YR 5/3) loam. The sediments are single grained to weakly developed and blocky. The lower boundary is abrupt and smooth to wavy. Sediments include 1% poorly-sorted, angular sandstone pebbles and cobbles and exhibit a violent reaction to hydrochloric acid. There is bioturbation from roots in this layer. No cultural materials were collected from Stratum I.

Stratum II — Stratum II is a 12 to 19 cm pale-brown (10YR 6/3), well-developed, blocky clay loam. The percentage of poorly-sorted angular pebbles and cobbles increases to 15% and sediments again show a violent reaction to hydrochloric acid. Disturbance from roots continues from the layer above. Cultural material was collected from this layer.

Stratum III — Stratum III is a layer of dark brown (10YR 4/3) sandy loam with a weak to moderate blocky structure. Pebbles and cobbles increase to between 30 and 40% of the matrix and bioturbation continues from above. No calcium carbonate is present. This stratum is at least 16 cm thick; however, the lower boundary remains concealed. One flaked lithic artifact was collected from the top of the stratum.

Stratum IV — Stratum IV is a thin (2 to 3 cm) lens of sandy clay loam bisecting Stratum II. The pale-brown sediments (10YR 6/3) are weakly developed and blocky; the lower boundary is abrupt and smooth. Sediments are made up of 1% angular pebbles and react violently to hydrochloric acid. The stratum is visible only in the west wall profile. No cultural material was present in this stratum.

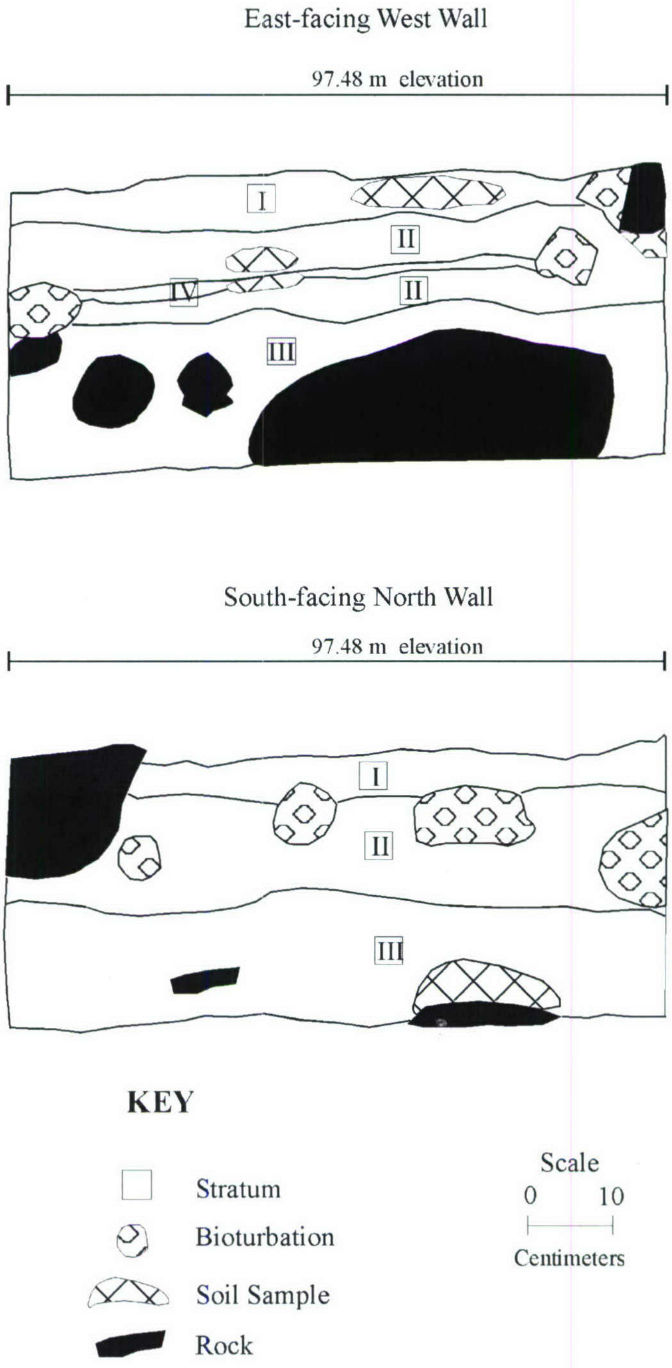


Figure 6.17. West wall profile and north wall profile, Test Unit 3, 5LA3333.

Structure 2 appears to be related to the site's historic component. This interpretation is based on its similarity to other more obvious historic structures. The amount of wall fall in the vicinity of the structure suggests that this structure was obviously taller at one time. There is no apparent doorway. Although several historic artifacts and one prehistoric artifact were recovered from Structure 2, the small and fragmentary nature of these artifacts give no real indication of the structure's function. The paucity of cultural material both on the surface and from subsurface testing suggests that the structure was not a domicile. It may have served some other purpose such as a livestock pen.

Test Unit 4

Test Unit 4, a 1 m x 1 m test unit, was placed within Structure 3, originally recorded as a set of stone piers that may have supported a log structure. Test Unit 4 was excavated in three layers to a final depth of between 47 and 55 cm bgs. The unit datum was set in the northeast corner of the unit at 87.50mN, 144.31mE, at an elevation of 2.45 mbsd for an arbitrary elevation of 97.55 m.

Layer 1 was excavated as a single stratigraphic layer reaching depths of between 2 and 6 cm below the ground surface. The sediments were dry and contained only a small amount of gravel. There was a high percentage of bioturbation, mainly from roots. One piece of lithic debitage was recovered from the layer (Table 6.5). A change to Layer 2 was indicated as the sediments became more compact and contained more gravels.

Table 6.5. Test Unit 4 artifact summary, 5LA3333.

Test Unit	Layer	Level	Thickness Range	Materials Recovered	
				1/4"	1/16" Control
Unit 4	Layer 1	*	2 - 6 cm	1 flaked lithic artifact	None
Unit 4	Layer 2	Level 1	3 - 10 cm	1 flaked lithic artifact	1 gastropod sample
Unit 4	Layer 2	Level 2	10 cm	1 flaked lithic artifact, 1 flaked tool	1 charcoal sample
Unit 4	Layer 3	Level 1	10 cm	2 bulk bone	1 bulk bone, 1 flaked lithic artifact
Unit 4	Layer 3	Level 2	10 cm	None	None
Unit 4	Layer 3	Level 3	10 cm	None	None

*Excavated as a single stratigraphic layer

Layer 2 was excavated in two levels. The sediments were bioturbated by small roots and contained gravel inclusions. No historic artifacts were recovered; however, lithic debitage and charcoal were found in Layer 2 before a change to Layer 3 was indicated. Layer 2 ranged in thickness from between 13 and 20 cm.

Sediments in Layer 3 were lighter in color and more compact than the above layers. There was less bioturbation and fewer rocks. Excavation of Layer 3 was completed in three

levels. A light gray stain identified in the west wall was later determined to be non-cultural. A few small bone fragments and one flaked lithic artifact were found within the first 10 cm of this 30 cm thick layer. Excavations were terminated in Test Unit 4 after 20 cm of culturally sterile sediments had been removed.

Three strata were recorded in the south-facing north wall profile of Test Unit 4; four strata were identified in the east-facing west wall and are described below (Figure 6.18).

Stratum I — Stratum I is a thin (4 to 8 cm) layer of pinkish gray (7.5YR 6/2) loam. The sediments are single grained to platy and weakly developed. The lower boundary is abrupt and smooth; calcium carbonate is not present. The layer consists of 1 to 3% angular, poorly sorted gravels and is disturbed by root growth. One lithic flake was collected from this stratum.

Stratum II — Stratum II is a 10 to 40 cm thick, pale brown (10YR 6/3) layer of loam. Sediments are angular and moderately developed. The lower boundary is clear to abrupt and irregular. Gravels make up 1 to 3% of the bioturbated matrix. Calcium carbonates are present but minimal. A small portion of the lower boundary in the southwest corner of the unit remains concealed. A small amount of cultural material was recovered from this stratum.

Stratum III — The exposed portion of Stratum III consists of a very pale brown (10YR 7/3) clay loam. The sediments are angular, blocky, and well developed. Gravels continue to comprise 1 to 3% of the matrix and bioturbation continues from above. Sediments show a moderate reaction to hydrochloric acid. The thickness of this stratum is at least 38 cm; however, the lower boundary remains concealed. A minimal amount of cultural material was recovered near the Stratum II/Stratum III transition.

Stratum IV — Stratum IV is a 6 to 9 cm thick, 23 cm long lens of gray (10YR 6/1) clay loam that lies above Stratum III and protrudes into Stratum II. It consists of blocky, well-developed sediments and includes 1% angular, poorly sorted gravels. The layer has an abrupt and smooth lower boundary. This layer is also heavily bioturbated and the sediments react violently to hydrochloric acid. No artifacts were identified in this stratum.

After reaching a final excavation depth of between 47 and 55 cm bgs excavations were discontinued; no historic artifacts were found within the remains of this possible structure. Although evidence of a prehistoric component was noted, bioturbation was present at all depths within the unit. Structure 3 is located outside the protective fence boundary and may have been impacted by tracked vehicular maneuvers since it was first recorded.

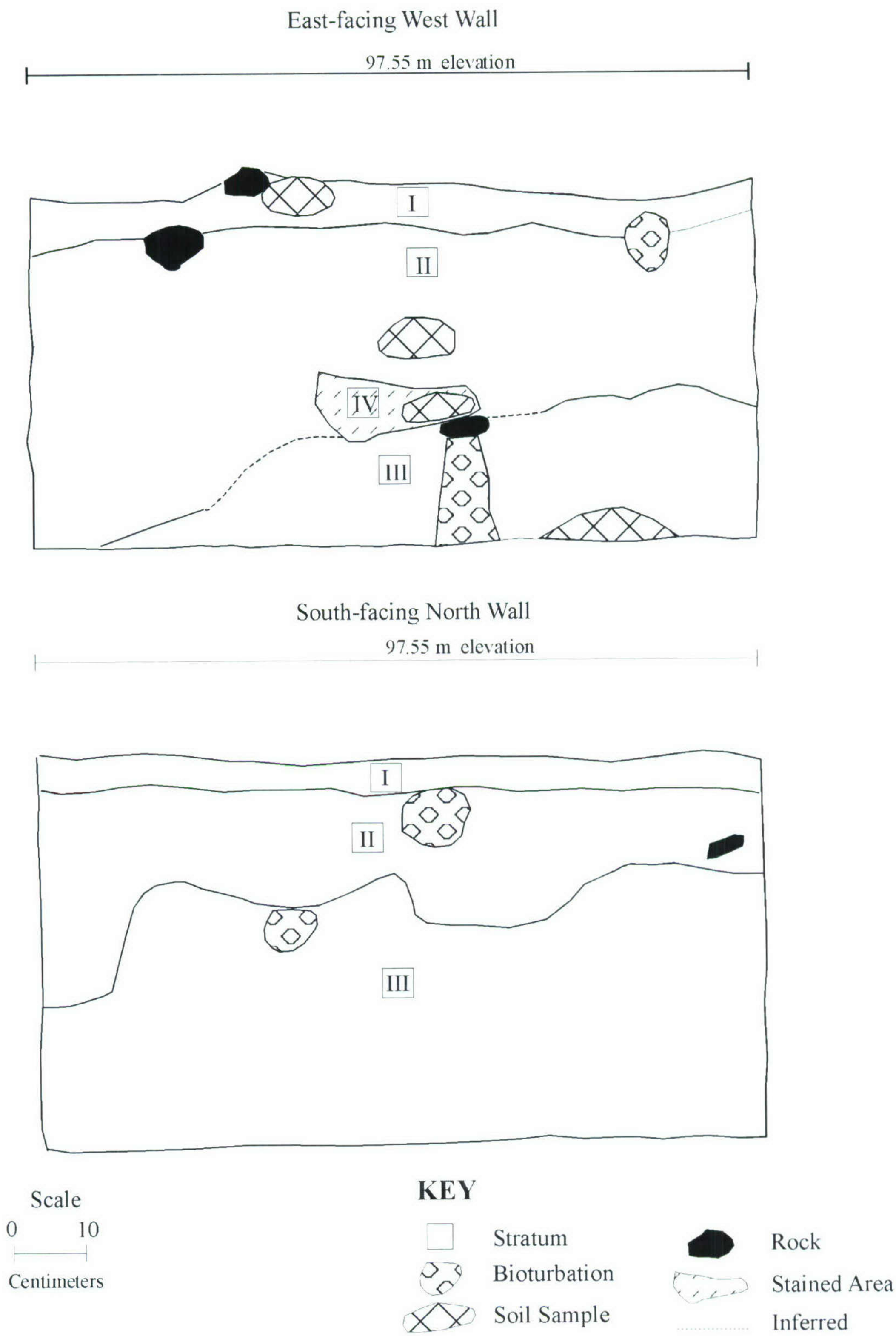


Figure 6.18. East wall profile and north wall profile, Test Unit 4, 5LA3333.

Test Unit 5

Test Unit 5 was a 1 m x 1 m test unit positioned in the southeast corner of Structure 4, the most intact structure at this site (Figure 6.8). The datum was placed at 80.19mN, 126.75mE, at an elevation of 2.04 mbsd for an arbitrary elevation of 97.96 m. Test Unit 5 was excavated in six layers to a depth of between 54 and 72 cm bgs. Most of Layer 1 consisted of sandstone slabs fallen from the walls of Structure 4. The sediment between the rocks was loose and contained some duff and grasses. The wall fall was mapped and removed. Layer 1 ranged in thickness from 2 to 7 cm and contained burned wood and a large piece of barbed wire protruding from the ground. A small sample of charcoal was collected from this layer (Table 6.6).

Table 6.6. Test Unit 5 artifact summary, 5LA3333.

Test Unit	Layer	Level	Thickness Range	Materials Recovered	
				1/4"	1/16" Control
5	Layer 1	*	0 - 7 cm	1 charcoal sample	None
5	Layer 2	Level 1	0 - 10 cm	None	None
5	Layer 2	Level 2	2-8 cm	1 charcoal sample	1 charcoal sample, 1 macrobotanical sample
5	Layer 3	*	10 - 16 cm	7 nails, 1 screw, 1 nut,132 pieces of miscellaneous metal, 1 bulk bone, 1 charcoal sample, 1 unknown material, 1 barbed wire, 2 glass fragments	1 charcoal sample, 1 macrobotanical sample
5	Layer 4	*	10 cm	1 nail, 17 miscellaneous metal, 2 bulk bone, 7 glass fragments, 1 macrobotanical sample	1 flaked lithic artifact, 1 historic ceramic, 2 glass fragments, 2 miscellaneous metal
5	Layer 5	*	10 cm	1 flaked lithic artifact, 3 groundstone, 1 bulk bone	1 piece of tarpaper, 1 charcoal sample
5	Layer 6	Level 1	10 - 12 cm	2 pieces of tarpaper	1 charcoal sample
5	Layer 6	Level 2	8 - 10 cm	1 flaked lithic artifact	None

Layer 2 was excavated in two levels and consisted primarily of loosely compacted, coarse grained sediments except in the northeast corner where the fill was very fine and lighter in color. Because Layer 1 consisted mainly of rock fall, the excavation of Layer 2 required that the highest elevation areas be excavated first in order to level the sediments in the unit floor. The southeast corner of the unit required the removal of a greater amount of fill than the lower area in the northwest corner. Large rodent holes appeared in the walls of the unit and small amounts of roots and grasses were found. Near the bottom of Layer 2, which ranged in thickness from between 2 and 18 cm, rocks in the eastern half of the unit appeared to be forming an arching pattern or flagstoned area. There were also bits of charcoal within the fill that gave the impression that there may have been a stove or a hearth nearby. A layer change was indicated as sediments became much harder and broke off in large aggregates. No artifacts were collected from Layer 2 (Table 6.6).

Layer 3 was excavated as a single stratigraphic layer and ranged in thickness from between 10 and 16 cm. Charcoal, glass, bulk bone, and metal were found in this layer. A portion of the layer consisted of a very white, chalky fill that may be wall mortar but which was speckled with quite a bit of charcoal. A change to Layer 4 was made when sediments became darker, more platy, and speckled with white flecks.

Layer 4 was excavated as a single 10 cm thick stratigraphic layer that became less structured, almost sandy, at its bottom. Glass, bulk bone, a historic ceramic fragment, one flaked lithic artifact, and miscellaneous metal were recovered from Layer 4.

In Layer 5, the soil was darker and less structured, at times almost single grained, but with a greater number of sandstone pebbles. The loose sediments differed from those found in other test units at this site. Layer 5 was removed as a single stratigraphic layer. The discovery of ground stone and one lithic flake in this layer suggest that the historic floor may have been reached and even penetrated in this layer. These prehistoric artifacts were found from between 24 and 40 cm below the ground surface. In all, one mano, two groundstone fragments, one flaked lithic, one bone fragment, and tar paper were recovered from Layer 5.

One more layer change was made as the soil was again loose and unstructured but somewhat lighter in color. Layer 6 was excavated in two levels. Although a piece of tar paper, a lithic flake, and a small amount of charcoal were found, all were attributed to rodent burrowing. Excavation was halted in Layer 6 after the removal of between 18 to 20 cm of culturally sterile sediments.

Five strata were identified in the north-facing south wall and the west-facing east wall of Test Unit 5, they are described below (Figure 6.19).

Stratum I	Stratum I is a 13 to 26 cm thick, dark brown (7.5YR 4/2) clay with a blocky structure. The layer consists of less than 5% gravels and is heavily disturbed by vegetation and rodents. The lower boundary is clear and discontinuous. Sediments react moderately to hydrochloric acid. No artifacts were collected from this layer; however, wall fall was noted and mapped.
Stratum II	Sediment depth in this stratum ranges from between 3 to 13 cm thick. This loam is light gray (2.5YR 7/2) and platy. The sediments react violently to hydrochloric acid. Bioturbation continues, mainly from rodent burrowing. The lower boundary is clear and smooth to irregular. Cultural materials were collected from this stratum.

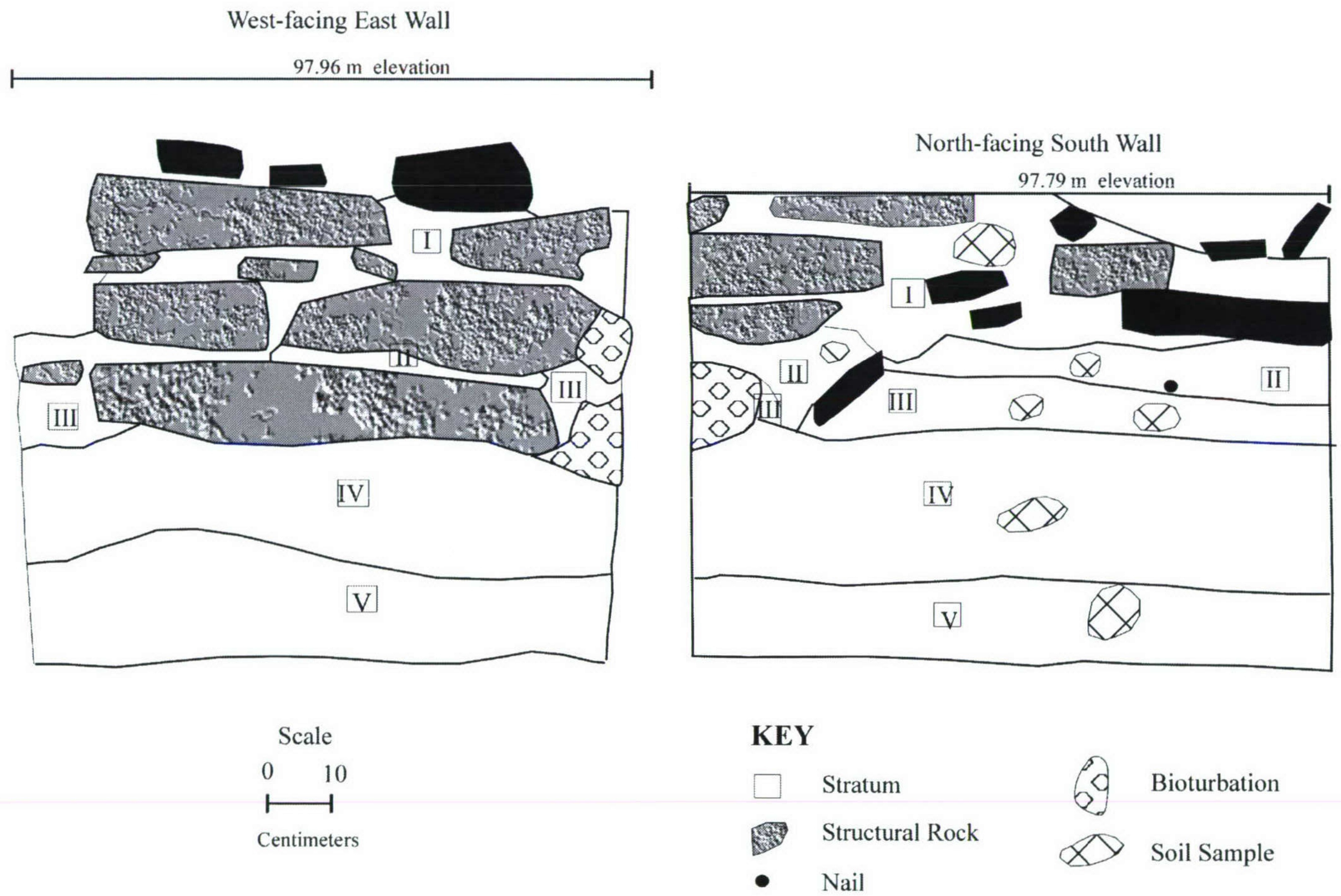


Figure 6.19. East wall profile and south wall profile, Test Unit 5, 5LA3333.

Stratum III Stratum III is a 6 to 12 cm thick, brown (7.5YR 5/2) silt loam. The sediments are angular to subangular and blocky. The lower boundary is clear and discontinuous. Gravels makeup less than 5% of the matrix. Bioturbation continues from the layers above. A high level of calcium carbonate is also present in this layer. The base of this stratum corresponds to the base of the structure's stone walls. Cultural materials were recovered from this stratum.

Stratum IV Stratum IV is a 19 to 24 cm thick, dark brown (7.5YR 4/4), single grained subangular loam. The lower boundary is clear and smooth. Like the strata above, there is a high percentage of disturbance from rodent burrowing. Again, gravel makes up less than5% of the matrix. Sediments show a moderate reaction to hydrochloric acid. This stratum contained cultural materials.

Stratum V Where exposed, Stratum V is 11 to 21 cm thick. The sediments are a pinkish gray (5YR 6/2), single grained subangular loam that reacts violently to hydrochloric acid. Rodent burrowing continues from above. The lower boundary is concealed. Although artifacts were collected from this stratum, all were associated with bioturbation and the stratum is considered to be culturally sterile.

Six soil/sediment samples from this test unit were submitted to Colorado Analytical Laboratories for textural analysis. The results of their hydrometer analysis slightly changed our field recordings. The most significant change was in Stratum I, which had been recorded as a silty clay and the hydrometer results showed there to be more clay (53%) than had been recorded. Stratum II sediments are a loam and Stratum III a silt loam. Strata IV and V are both loams. In the field it was determined that all the samples were either silty clay loams or silt loams. The laboratory analysis showed that the sediments in general had a tendency to fine upwards. This suggests that there has been little time for the sediments to have weathered and for the clays to have translocated through the soil profile. This is consistent with the recent nature of the site. In Strata IV and V sediments are a loam. It is within Stratum IV where it is believed the floor of the structure was encountered, although it was not clearly visible during excavation. Excavations below Stratum IV recovered prehistoric artifacts in a loamy context. At this elevation, the sediments had not been disturbed historically (with the exception of bioturbation). A sample of Layer 3, Level 3 was collected and sent to Colorado Analytical for textural analysis. This is the layer with high calcium carbonate inclusions. The textural analysis demonstrated this to be a silt loam, very similar to the silt content in Stratum III. With the exception of the higher calcium carbonate inclusions, there is little difference between Layer 3, Level 3 and that of Stratum III.

Structure 4 is the most intact historic structure at 5LA3333. Domestic use is inferred from the artifact assemblage. This assemblage includes a variety of cultural material including glass, metal, ceramics, bulk bone, and tar paper. The presence of tar paper suggests the structure was roofed. An unprepared living surface was noted. No features were identified but the presence of charcoal may relate to cooking or heating activities. Structure 4 most

likely represents a dwelling; however there is little evidence of long-term use. Cultural deposits have been compromised by bioturbation.

Test Unit 6

Test Unit 6 was a 1 m x 1 m test unit placed within Feature 3 to investigate its original interpretation as a privy (Carrillo, 1984). The unit datum was originally set in at 86.35mN, 130.64mE, at an elevation of 2.31 mbsd or an arbitrary elevation of 97.69 m; a new datum was established at 85.77mN, 130.28mE, that also had an elevation of 2.31 mbsd (97.69 m when the original datum was dislodged during the excavation of Layer 3, Level 2.

Three layers were excavated in Test Unit 6. Layer 1 was the loose overburden. Historic ceramic fragments, metal, and one bulk bone were collected from Layer 1 which was between 1 and 3 cm thick (Table 6.7).

Table 6.7. Test Unit 6 artifact summary, 5LA3333.

Test Unit	Layer	Level	Thickness Range	Materials Recovered	
				1/4"	1/16" Control
6	Layer 1	*	1 - 3 cm	3 nails, 1 metal buckle, 1 bulk bone, 10 historic ceramic fragments	None
6	Layer 2	Level 1	7 - 10.5 cm	4 nails, 7 historic ceramic fragments, 2 flaked lithic artifacts	3 historic ceramic fragments, 1 gastropod sample
6	Layer 2	Level 2	7 - 16 cm	1 projectile point, 2 historic ceramic fragments, 2 nails, 2 flaked lithic artifacts	2 flaked lithic artifacts
6	Layer 3	Level 1	3 - 10.5 cm	1 na il, 3 flaked lithic artifacts	None
6	Layer 3	Level 2	9 - 10 cm	None	None
6	Layer 3	Level 3	11 - 13 cm	None	1 gastropod sample

Layer 2 was excavated in two levels and ranged in thickness from between 15 and 23 cm. The sediments were more compact with a better developed soil structure than the overburden. The layer was bioturbated by small roots and rodent burrowing and, nearing the bottom of the layer, the number of pebbles and cobbles increased. Both historic and prehistoric artifacts were found in this layer including historic ceramics, metal, lithic flakes, and one projectile point. A layer change was indicated as the sediments became more compacted.

In Layer 3, bioturbation continued from above, while the amount of gravel decreased. The layer was excavated in three levels and ranged in thickness from between 24 to 31 cm. Lithic debitage and one nail were found in the first level of Layer 3. The following two levels were culturally sterile and excavations were terminated. Test Unit 6 was excavated to a final depth from between 47 to 53 cm bgs.

Three strata were identified in the north-facing south wall and the east-facing west wall of Test Unit 6 and are described below (Figure 6.20).

Stratum I Stratum I is a thin (2 to 5 cm) layer of brown (10YR 5/3), single grained loamy sand with an abrupt and smooth lower boundary. The matrix is composed of 0 to 5% poorly sorted sandstone pebbles. Sediments show little to no reaction to hydrochloric acid. Some bioturbation is evident. Cultural materials were recovered from this stratum.

Stratum II Stratum II is a 12 to 25 cm thick brown (10YR 5/3) sandy loam. The sediments are weakly developed and blocky; the lower boundary of the layer is diffuse and irregular. The layer is composed of between 1 to 3% sandstone pebbles to cobbles including clasts of $CaCO^3$. The sediments react slightly to hydrochloric acid and show evidence of bioturbation. Cultural materials were recovered from this layer.

Stratum III Stratum III is a very pale brown (10YR 7/3), well-developed and blocky clay loam. The sediments include 3 to 4% poorly sorted pebbles that react violently to hydrochloric acid. Bioturbation is present. Where exposed, the stratum is at least 29 cm thick; the lower boundary remained concealed. Cultural material was collected from near the transition of Stratum II to Stratum III.

Soil samples from Strata I through III were sent to Colorado Analytical for textural analysis. Stratum I is a loam and Stratum II is a sandy loam. Translocation of clays into Stratum III has significantly increased the percentage of clay from 14% in Stratum I to 31% in Stratum III. This is consistent with soil weathering over a relatively long period and an active argillic B horizon. It is also probable that slope wash has influenced the silt/clay content as these finer sediments have accumulated in this portion of the site.

The excavation of Test Unit 6 indicates that this area has been subjected to substantial amounts of bioturbation and slope wash. This may account for the distribution of both historic and prehistoric artifacts in several layers. There is no real evidence, based on the fill or the amount or nature of the artifacts discovered, to support the interpretation that Feature 3 is the location of a historic privy.

Test Unit 7

Test Unit 7 was a 1.5 m x 1.5 m test unit placed in an area where data acquired from the gradiometer revealed the presence of a magnetic anomaly. The unit datum was set at 69.81mN, 121.58mE, at an elevation of 2.9 mbsd or an arbitrary elevation of 97.10 m. Test Unit 7 was excavated in two layers to a final depth of between 36 and 44 cm bgs.

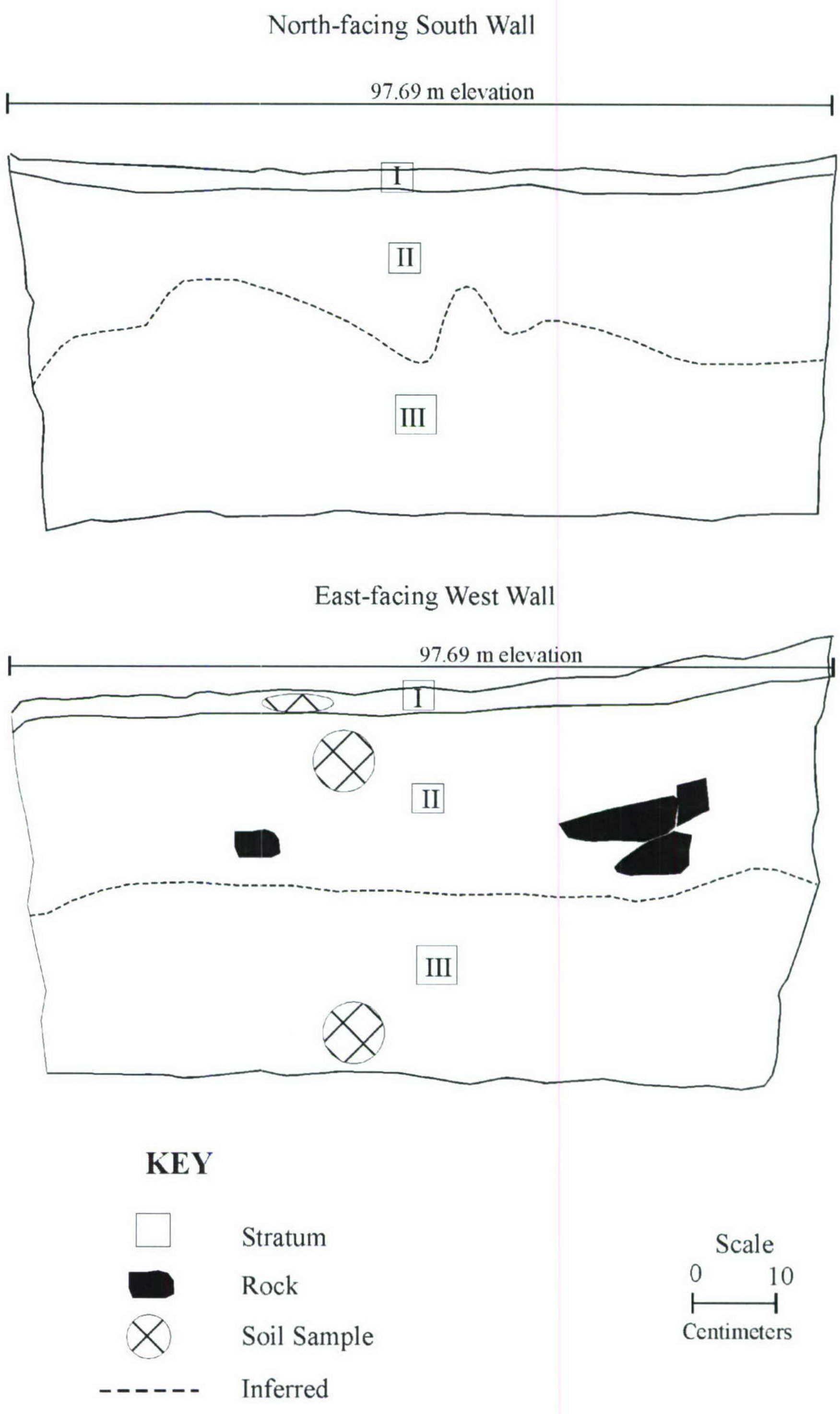


Figure 6.20. South wall profile and west wall profile, Test Unit 6, 5LA3333.

Layer 1 was a thin layer (1 to 4 cm) of loose surface sediments with many grasses, roots, and sandstone pebbles. Five large nails (40d) were exposed at the surface and continued either vertically or at an angle as if driven into the ground. Nails, pieces of miscellaneous metal, flaked lithic artifacts, and one piece of glass were recovered from Layer 1 (Table 6.8).

Table 6.8. Test Unit 7 artifact summary, 5LA3333.

Test Unit	Layer	Level	Thickness Range	Materials Recovered	
				1/4"	1/16" Control
7	Layer 1	*	1 - 4 cm	10 nails, 1 metal strap, 1 miscellaneous metal, 1 glass fragment, 1 steel tag, 1 metal latch	1 miscellaneous metal, 2 flaked lithic artifacts, 1 charcoal sample, 1 gastropod sample
7	Layer 2	Level 1	6 - 11 cm	7 nails, 4 flaked lithic artifacts, 1 bulk bone	1 piece of miscellaneous metal, 1 charcoal sample
7	Layer 2	Level 2	8.5 - 11.5 cm	6 nails, 1 bulk bone	None
7	Layer 2	Level 3	8 - 11 cm	1 nail, 1glass fragment, 1 bulk bone, 1 flaked lithic artifact	1 flaked lithic artifact, 1 charcoal sample
7	Layer 2	Level 4	9 - 10 cm	None	1 flaked lithic artifact

*Excavated as a single stratigraphic layer.

Layer 2 was excavated in four levels reaching a final thickness of between 35 and 40 cm. The sediments were compact with a highly developed structure. Rodent burrowing, roots, and large, red sandstone cobbles were evident throughout. The last of the upright nails were removed in the first 20 cm of the layer. Other artifacts recovered from Layer 2 included lithic flakes, glass, bulk bone, and miscellaneous metal pieces. Artifacts recovered from the lower portions of the layer were attributed to rodent burrowing. Excavations in Test Unit 7 ceased after 15 cm of what were considered to be culturally sterile sediments.

Three strata were recorded in the west-facing east wall and the south-facing north wall profiles of Test Unit 7 and these are described below (Figure 6.21).

Stratum I — Stratum I is a thin (5 to 7 cm) layer of pale brown (10YR 6/3) sandy clay loam. The sediments are single grained, weakly developed, and react moderately to hydrochloric acid. Approximately 1% of the sediments are composed of gravel. Some bioturbation is evident in the layer. The lower boundary is abrupt and smooth. Cultural materials were recovered from this stratum.

Stratum II — Stratum II is 5 to 9 cm thick and is composed of a brown (10YR 5/3) fine loam. The sediments are moderately well-developed, blocky, and include 1% sandstone gravels. The lower boundary is clear to gradual and smooth to wavy. A high level of calcium carbonate is present. Artifacts were collected from Stratum II.

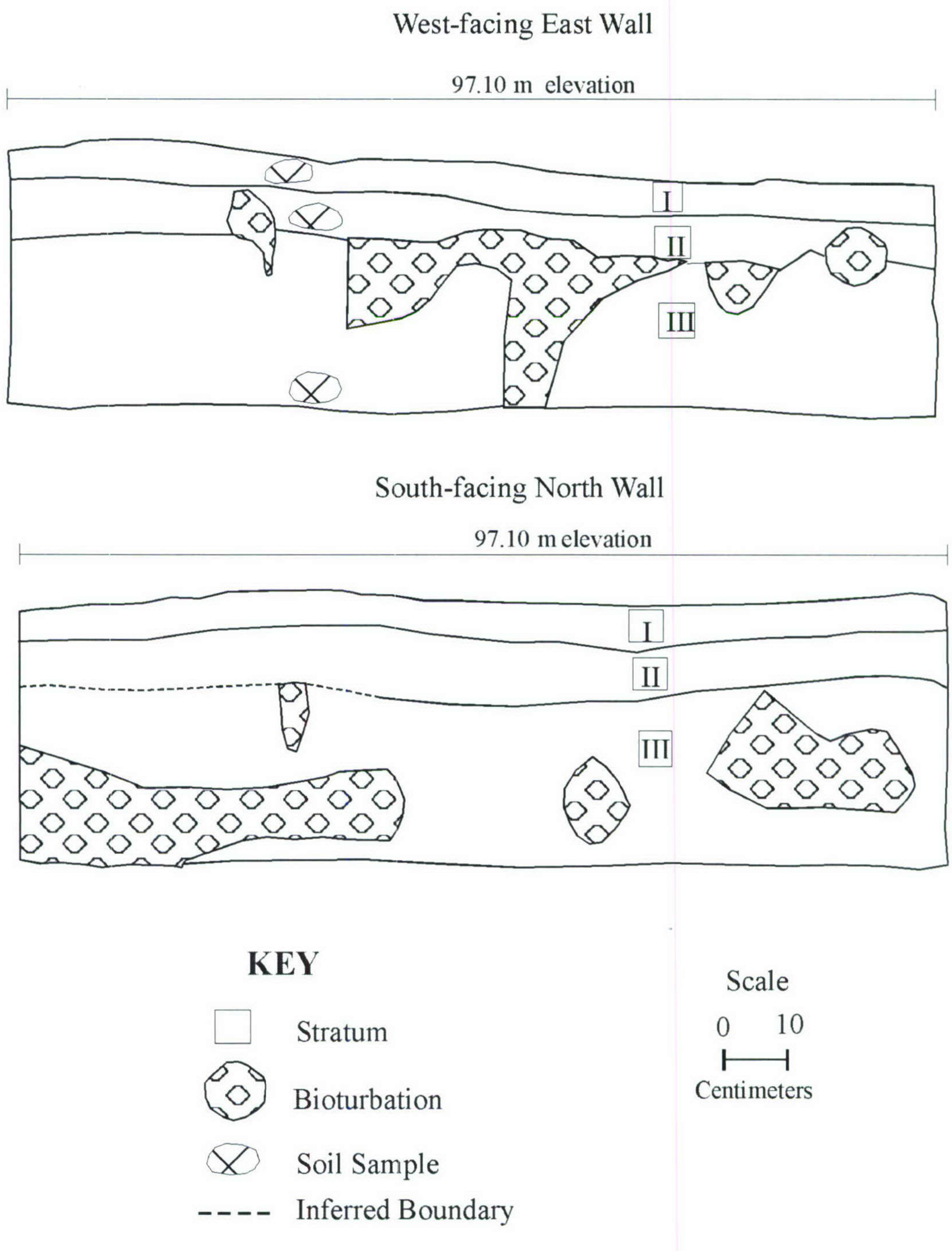


Figure 6.21. East wall profile and north wall profile, Test Unit 7, 5LA3333.

Stratum III — Stratum III consists of a light gray (10YR 7/2), well-developed, blocky clay loam. Sediments include 1% sandstone gravel. A high percentage of calcium carbonate continues from the above stratum. The lower boundary of Stratum III is concealed. Cultural materials were collected primarily from the upper portions of this bioturbated stratum.

The magnetic anomaly revealed by gradiometric testing was caused by 13 large nails driven vertically or at slight angles into the ground in a roughly arcing pattern. No wood or other materials into which the nails may have been driven were uncovered. Although it is possible that the nails may have been used to stake materials such as a hide for drying or curing, no clear evidence of these activities was found and their function or use remains unknown. In addition, the presence of temporally mixed artifacts found in the unit indicate that slope wash and bioturbation have affected the area. The nails, however, appear to be in their original position.

Historical Research

Historic research was undertaken to summarize the general pattern of the historic settlement of the area and to place this site within that time frame. Additionally, this research was intended to personalize the historic settlement pattern by identifying ownership of the homestead as well as the types of economic activities engaged in at the homestead and any other events relevant to its occupants. Descendants of the family holding the original patent on the land where the site is located were still living in the area now known as the PCMS when the army acquired the land. In many ways their personal history neatly parallels the settlement pattern for the general area.

A number of sources were consulted during the research for this project. These include archival sources such as the General Land Office (GLO) Records of the Bureau of Land Management (BLM) and the Federal Population Census. Friedman (1985) and Loendorf and Clise (1997) also proved to be valuable resources both in identifying broad patterns of historical human behavior at the PCMS and in providing details of personal communications with Mary Ann Mincic, a descendant of the site's original homesteader.

Although the period of Early Settlement in the PCMS is generally considered to be 1849 to 1890 (Hardesty, et. al. 1995, Friedman 1985) and encompasses the formation of the first ranches and communities in the region, Friedman (1985:73) identifies the year 1867 as the beginning of permanent Euro-American settlement. During the years between 1867 and 1888 the majority of settlers that moved into the region were Hispanic sheep herders and subsistence farmers from northern New Mexico. They formed small communities along the Purgatoire River, particularly in the Red Rocks area (Friedman 1985:99). During this same period open range cattle were introduced from Texas. According to Friedman (1985) settlers with Hispanic surnames were largely occupied by sheep ranching while those of Anglo-American descent were associated with cattle.

While this settlement period was fueled by a number of factors, it gained strength five years after the passage of the Homestead Act of 1862. The Homestead Act specified that settlers could claim up to 160 acres of public domain if they proved they lived on the property and cultivated it (Friedman 1985:161). Those making the investment in time, money, and effort to build homes and other structures and to cultivate the land were most likely to apply for legal title to the land. Most often it took five years for a homesteader to "prove up" a claim and to obtain the federal patent. If this holds true, one can assume that a settler occupied a parcel of land approximately five years prior to the date the land patent was granted (Friedman 1985).

The Hispanic population reached a high in 1880 and began declining after 1888. Although the region continued to be dominated by Anglo-American cattle and sheep ranching activities, the period from 1891 to 1910 was largely one of economic stagnation in the area (Friedman 1985:101). The passage of two new federal laws, the Enlarged Homestead Act of 1909 and the Stock Raising Homestead Act of 1916, made the years 1916 to 1919 the most intense settlement era in the history of the PCMS. Much of this movement was caused by new homesteaders coming into the region in hopes of dry-land farming.

Although the livestock business continued to grow in the late 19th and early 20th centuries, this industry was transformed after 1910 with the many new homesteaders who arrived in the area intent on dry-land farming. To protect their homesteads and their crops from the open range livestock, these new settlers began fencing the open range. Although drought and depression forced many dry-land farmers to sell their homesteads and leave the region, those who remained took up ranching as their primary livelihood. Sheep herding continued to be important until the 1940s when many sheep ranchers switched to cattle ranching. The only other industry to have an impact on the project area was the energy business (Friedman 1985:101).

The land where site 5LA3333 is located was first acquired by Harold Sater in 1922 under the Homestead Act of 1862 (Table 6.9). Little information about Harold Sater could be found, although descendants of the Sater family were still living on the PCMS when the U.S. Army purchased the land in the 1980s (Friedman 1985). Those family members are direct descendants of Nellie Sater, the sister of Harold Sater. The history of the Sater family bears out the general pattern of homesteading during this time period.

According to Friedman (1985) the Sater family first came to the area in 1916. Robert Sater, the head of the family, was an army veteran and had been a contractor building railroad grades in Arkansas. After a failed attempt at farming in Oklahoma, Robert Sater moved his family to Timpas, Colorado, southwest of La Junta, around 1916. In 1921 Robert Sater received two separate land patents for 320 acres (www.glorecords.blm.com). Table 6.9 shows the original land patents granted to the Sater family.

Table 6.9. Sater family land patents.

Patentee	Issue Date	Doc. #	Access./Ser #	Legal Land Description		Title Transfer Authority	Acres
				Township and Range	1/4 Sections		
Harold T. Sater	11/27/1922	029109	889134	T 29S R 58W	N 1/2 of Section 35	Homestead Act of 1862 (12 Stat. 392)	320
Harold T. Sater	6/13/1923	037399	908934	T 29S R 58W	E 1/2 of Section 34	Stock Raising Homestead Act of 1916 (39 Stat. 862)	320
Nellie Sater	12/18/1922	029208	890971	T 29S R 58W	SE 1/4 of Section 35	Homestead Act of 1862 (12 Stat. 392)	320.55
				T 30S R 58W	S 1/2 of the NE 1/4 of Section 3, NE 1/4 of the NE 1/4 of Section 2 (Lot 1), NW 1/4 of the NE 1/4 of Section 2 (Lot 2)		
Nellie Sater	4/2/1924	031656	935597	T 29S R 58W	SW 1/4 of Section 35	Stock Raising Homestead Act of 1916 (39 Stat. 862)	320.37
				T 30S R 58W	S 1/2 of the NW 1/4 of Section 2, NE 1/4 of the NW 1/4 of Section 2 (Lot 3), NW 1/4 of the NW 1/4 of Section 2 (Lot 4)		
Robert Sater	1/28/1921	027761	792569	T 30S R 58W	S 1/2 of Section 2	Stock Raising Homestead Act of 1916 (39 Stat. 862)	320
Robert Sater	1/28/1921	030269	792568	T 30S R 58W	SW 1/4 of Section 1, S 1/2 of the NW 1/4 of Section 1, NE 1/4 of the NW 1/4 of Section 1 (Lot 3), NW 1/4 of the NW 1/4 of Section 1 (Lot 4)	Homestead Act of 1862 (12 Stat. 392)	320.48
Claude Sater	8/13/1925	041060	965092	T 30S R 58W	N 1/2 of the N 1/2 of Section 13, SE 1/4 of the NE 1/4 of Section 13, E 1/2 of Section 14, N 1/2 of the NE 1/4 of Section 23	Stock Raising Homestead Act. of 1916 (39 Stat. 862)	641.78
				T 30S R 57W	NW 1/4 of the NW 1/4 of Section 18 (Lot 1)		

When the Saters first moved to the area they tried dry-land farming, growing about 40 acres of corn on Robert Sater's property. They had two good years farming. Following a disastrous third year they switched to raising cattle (Friedman 1985). More land was added to the family holdings when Harold Sater and Nellie Sater each received 320 acres in 1922 under the Homestead Act of 1862 and again in 1923 when Harold received an additional 320 acres under the Stock Raising Act of 1916. Nellie Sater received an additional 320 acres under the Stock Raising Act in 1924. The immediate Sater family finished out their land acquisition in 1925 when Claude Sater, another brother, gained 641 acres, also under the Stock Raising Act of 1916 (www.glorecords.blm.gov).

A search of the Soundex cards for the 1920 United States Federal Census turned up information only on Nellie Sater. In 1920, she is listed as living in Otero County, Colorado, and working as a waitress at a local hotel. In the census listing she is claimed as part of the household of a Francis E. Leser, a La Junta hotel manager. No census information for Robert, Harold or Claude Sater was acquired from the 1920 Soundex cards.

Nellie Sater married another homesteader, John Arnet, in 1924 (Friedman 1985, Loendorf and Clise 1997). Arnet moved to the Sater family homestead and the family raised cattle until they lost nearly everything in the Great Depression. In the 1930 Las Animas County Assessment Roll, John Arnet and Nellie Sater were assessed for 6,680 acres of land and $2,220 worth of cattle (Friedman 1985:229). They began raising sheep after 1933 and remained in the sheep business until the 1950s when they sold off their sheep and returned to the cattle business (Friedman 1985:236). John Arnet and Nellie Sater had a daughter, Mary Ann Arnet. Mary married Charles Mincic who worked for Colorado Interstate Gas. From 1962 to1983 Charles lived in Pueblo but returned to the ranch on weekends where Mary Ann lived with their children.

In personal interviews Mary Ann Mincic states that her mother, Nellie, had one brother who homesteaded to the south of the original Sater homestead and one brother who homesteaded to the north (Loendorf and Clise 1997). Claude Sater's land is to the south of the original family homestead and Harold Sater's land, and lies to the north of the land originally acquired by Robert Sater. Site 5LA3333 is probably located on Harold's land.

Material Culture

Historic Artifacts

Glass

A total of 30 glass fragments were collected from the site. Four were collected from the surface and the remaining 26 pieces were recovered from subsurface testing. The majority of the glass (93% or 28 fragments) is bottle or jar glass. Two fragments of solarized purple glass are too small for positive identification but are likely part of a lantern hurricane.

Bottle/Jar Glass No complete or nearly complete bottles were found. Most of the bottle/jar glass fragments are believed to be body or shoulder fragments. Glass colors found include aqua (19), clear (5), solarized purple (3), and green glass (1). Three small threaded neck pieces from a household jar and one base fragment were collected. All of these are aqua glass. Only one piece of the painted label from the back of a 7-UP bottle is identifiable by manufacturer. The 7-UP product was invented in 1929 by Charles Leiper Grigg. It was first marketed as "Bib-Label Lithiated Lemon-Lime Soda" but the name was quickly changed to 7-UP (www.7up.com/index/uspx). The small portion of the 7-UP bottle fragment collected here is mostly unreadable. No other dateable characteristics from the bottle can be identified so that it is unknown whether or not this glass is modern trash. The highest percentage of glass (35.7%) was recovered from Structure 4, the most intact structure at the site, and the most probable domicile (Table 6.10). Glass was collected in considerably smaller percentages from STPs 18 through 21, Structure 2, and extramural Test Unit 7.

Table 6.10: Summary of bottle/jar glass collected by quantity, 5LA3333.

Structure/ Feature No.	Clear	Aqua	Solarized Purple	Green	Total	%
surface	3	--	--	1	4	**14.3**
STP 18	--	1	1	--	2	**7.1**
STP 19	--	--	1	--	1	**3.6**
STP 20	--	1	--	--	1	**3.6**
STP 21	--	5	--	--	5	**17.9**
Structure 2	1	2	--	--	3	**10.7**

Modified Glass Modified glass was analyzed in a similar manner to modified lithics artifacts. However, because of the difficulty in determining use wear on heavily weathered glass only those glass fragments that possessed patterned flaking were analyzed as modified glass. Seven pieces of glass were determined to display characteristics of modification. Three modified glass fragments were recovered from subsurface testing. All were aqua glass. Of these, two had unimarginal flaking; one glass fragment had unimarginal and bimarginal modification. One piece of modified glass was recovered from STP 21, Layer 1, one was collected from Test Unit 5, Layer 4, Level 1 and the third was found in Test Unit 3, Layer 2, Level 1.

Four glass fragments collected from the surface also exhibited traits of modification. Three were clear glass flakes that appeared to have been struck from a larger glass specimen and exhibit bulbs of percussion. One of these "glass flakes" also has evidence of unimarginal, patterned retouch as does one other clear glass fragment. The fourth fragment, a large 7-Up bottle fragment previously discussed, has unimarginal flaking along two edges.

Ceramics

Twenty-one small fragments of hand-painted porcelain were collected from varying depths in Feature 3 (Test Unit 6). The fragments have an Oriental design; the design outline is painted with red paint. A more diluted red paint is used to create a border on the rim pieces and a diluted green paint is used to fill in some parts of the design but bleeds outside of the lines in most cases. The fragments most likely represent the remains of one vessel.

Metal

Wire Nails Forty-seven wire nails were collected during subsurface testing. The majority of the nails (26) were collected from Test Unit 7. Of these, 13 were 40d nails found driven vertically or at a slight angle into the ground. No timber or other structural material was uncovered in association with these nails and their purpose remains unknown. An assortment of other sized wire nails including 5d (1), 7d (1), 8d (5), 9d (2), 10d (2), a small brad, and a bent/fragmented wire nail were also collected from this unit. Ten nails were collected from Feature 3, the possible privy; eight, mostly bent and fragmented, wire nails were recovered from Structure 4. Single nails were also collected from STP 20, Structure 1 and Structure 2.

Horseshoe Nails Two broken, bent, and corroded horseshoe nails were collected from shovel tests. One was collected from STP 21 at a depth of between 10 and 20 cm; the other was recovered from STP 13 at between 20 and 40 cm below the ground surface. Both nails were too fragmented to determine their total length

Buckle The remains of one buckle was recovered from Feature 3 (possible privy) in Test Unit 6, Layer 1. The buckle measures 1¾ in x 1 ⅛ in and is likely from a suspender or vest.

Washer One washer was collected from STP 3 at a depth of between 5 and 20 cm bgs. The washer is 1 inch in diameter and ¼ in thick.

Strap A fragment of a metal barrel strap ⅜ in wide and 10 in long was collected from Test Unit 7, Level 1.

Wire One bent and corroded fragment of wire ⅛ in thick and over 8 in long was collected at a depth of between 5 and 10 cm from STP 14. This single strand wire is unbarbed.

Barbed Wire The barbed wire specimen found at this site is a double-strand wire with a two-point wire barb that most resembles Glidden's Barb. This barbed wire is a common variation of patent 157124 invented by Joseph F. Glidden of De Kalb, Illinois, and patented on November 24, 1874 (Clifton 1970:99). This piece of barbed wire was collected from Structure 4, Test Unit 5, Layer 3.

Nut One square nut was collected from Structure 4. This metal piece measures ¾ in x ¾ in and is ⅜ in thick. This nut was recovered from Structure 4, Test Unit 5, Layer 3.

Latch One small oblong piece of metal with both ends extended and bent. The function of this specimen is unknown.

Screw One badly corroded screw was collected from Test Unit 5, Layer 3, in Structure 4.

Tin Can Lid Although extremely fragmented, one paint can lid was recovered from Structure 4, Test Unit 5, Layer 3. No manufacturer or other identifying characteristics are visible.

Tag One generally oval-shaped steel tag was collected from Test Unit 7, Layer 1. The tag measures 2 3/16 in x 1 in.

Unidentifiable Metal Fragments A small portion of the metal assemblage (13.1% or 98.1 g by weight) remains unidentifiable. This unidentifiable portion consists of metal too corroded and/or fragmented for further classification.

A total of 763.5 g of metal by weight was collected from the site. This includes wire nails (471.4 g or 61.7%), identifiable miscellaneous metal (194 g or 25.4%), and unidentifiable metal fragments (98.1 g or 12.9%). Overall, the highest percentage of metal artifacts by weight, 423.5 g or 55%, was recovered from Test Unit 7. Originally placed to test an anomaly noted during geophysical testing with the magnetometer, this unit revealed a high percentage of metal artifacts but few other clues to its possible function at the site. Structure 4 contained the next highest percentage of metal by weight (261.4g or 34.2%); however, much of this consists of unidentifiable fragments which give few clues to the use of this structure. Small amounts of metal were collected in considerably less percentages from Feature 3, STP 14, Structure 2, Structure 1, STP 3, STP 13, and STP 20.

Tar Paper/Roofing Material

Thirteen small, black tabular specimens collected from various depths in Structure 4, Test Unit 5 are likely remnants of shingles or other roofing material. This material was found only in Structure 4 and suggest a more permanent roof and/or insulation of the structure.

Prehistoric Artifacts

The prehistoric artifacts collected from the site in 2003 include one projectile point, six flaked lithic tools, thirty non-tool lithic flakes, two metate fragments, and one mano. In addition, twenty-two lithic flakes were analyzed in the field and are included in the following discussion.

Flaked Lithic Artifacts

Bifaces One projectile point (5LA03333.022.187) was recovered from Layer 2, Level 2 of Test Unit 6. It is large with an expanding stemmed point (Figure 6.22). It is manufactured from fine grained, gray quartzite with red banding. The very tip, one shoulder, and one tang are missing. The blade has an elongated triangular shape with straight to slightly

convex blade edges. The side of the blade with the missing shoulder has a snap fracture where the shoulder would have been. This edge feels ground and there is a small amount of visible use wear suggesting that this artifact may have served multiple uses. This use may partially explain the asymmetrical shape of the blade edges. The remaining shoulder is abrupt. The expanding stem has a rounded tang and a convex base. This specimen is bi-convex in cross-section. Based on comparisons made to descriptions and photographs in Lintz and Anderson (1989), characteristics of this projectile point best resemble Category P25 (Anderson 1989:141). There are some similarities to Category P26 (Anderson 1989:142), but the stems are too short in this category. All known examples of projectile points from Category P25 at the PCMS are surface finds with no associated dateable subsurface deposits. Based on the comparisons made by Anderson (1989:142), this point category has a Middle to Late Archaic date range from 1500 BC to 1000 BC (3450 to 2950 BP).

Flaked Lithic Tools Six flaked tools were collected in 2003 (Appendix VI). Four were collected during surface investigations; two were recovered from test unit excavation. One of the tools is a "snub nosed" end scraper that is categorized as a patterned flake tool. This scraper (5LA03333.022.032) was part of the surface collection and is made from red and purple chert. Patterned unifacial flaking is present along the thickest end of the flake which has been rounded by modification. There is extensive evidence of use wear along this beveled end. The lateral edges possess minimal unifacial retouching and bimarginal use wear. These lateral edges extend to the broken portion of the flake suggesting that this tool broke during use. All edges of this scraper exhibit use wear.

Figure 6.22. Projectile point, 5LA03333.022.187.

The remaining five flake tools are simple, unpatterned, retouched or utilized flakes that are largely the product of flake blank shape rather than intentional retouch. According to the definitions of Dean (1992) all are classified as of unknown function. The three unpatterned flaked lithic tools collected from the surface include an obsidian flake with bimarginal use wear and unimarginal retouching and two chert flakes. One is manufactured from dark red chert; the other is made from brown and red chert. Both exhibit evidence of bimarginal use wear and unimarginal retouching. One of the subsurface flake tools was recovered from Test Unit 3 (Layer 3, Level 1). This flake tool has unimarginal retouching on two opposite lateral edges. It is flaked from yellow-brown, fine-grained quartzite with a reddish brown weathered cortex. The other subsurface tool is manufactured from light gray silicified wood and exhibits evidence of minimal unimarginal use wear. This artifact was found in Test Unit 4 (Layer 2, Level 2).

Non-tool Flaked Lithic Artifacts In all 52 non-tool lithic flakes were analyzed (Table 6.11). Twenty-two (42.3%) flakes were surface artifacts recorded in the field; thirty flakes (57.7%) were collected during subsurface testing and were analyzed in the lab (Table 6.11). Flakes sized ½ in to 1 in (36.5%) and ¼ in to ½ in (46.2%) make up 82.7% of the assemblage. Shatter and simple flakes comprise 94.2% of all flakes analyzed. The lithic debitage found at this site is predominantly small- to medium-sized simple flakes or shatter with no remaining cortex (82.7%). Although the sample is small, given the very minimal percentage of bifacial thinning or complex flakes this may indicate that the prehistoric activities at this site included a higher incidence of middle-stage lithic reduction. The use of raw material types is spread relatively evenly among those materials found in the vicinity of the PCMS and do not represent transport over great distance.

Groundstone

Three sandstone bedrock metates (Features 1, 7, and 8) were recorded near the site datum. Feature 1 measured 44 cm x 16 cm, Feature 2 measured 25 cm x 25 cm and Feature 3 measured 40 cm x 20 cm. Additionally, two small sandstone metate fragments and one sandstone mano were collected during the excavation of Test Unit 5, Layer 5. The two metate fragments are less than 50% complete and are very lightly ground. Both fragments are small pieces of a larger metate with only a minimal amount of grinding surface still remaining. The mano is a sandstone cobble moderately ground on one surface.

Faunal Material

Sixteen pieces of bulk bone were collected from subsurface testing. The identifiable remains include one fragmented cottontail humerus, two rodent bones, one small mammal bone, and two large mammal bones. The remaining specimens were not identifiable. This small sample provides little insight to the economic activities or subsistence habits of either the prehistoric or historic habitants at this site.

Macrobotanical

Seeds Nineteen samples of seeds were collected, primarily from test unit control samples. After simple visual analysis only one of these was deemed significant enough for further analyses. All others appeared to represent natural deposition from the surrounding vegetation. Sample 5LA03333.022.055 was collected from Test Unit 5, Layer 4, Level 1 in Structure 4 and was sent to High Plains Macrobotanical Services, Inc. for analysis (Appendix II). This macrofloral analysis identified one modern puffball (*Lycoperdon perlatum*).

Other Organic Material

Shell Four samples of what were believed to be eggshell were collected. Two of these samples were too disintegrated for further analyses. The other two samples, collected from Test Unit 1, Layer 1 and Layer 2 of Structure 1, are believed to be eggshell; however, their location in this structure, which provided no other artifactual material relating to the historic

Table 6.11. Surface and Subsurface Non-Tool Lithic Debitage,

Material Type	Hornfels/Basalt				Dull Quartzite				Bright Orthoquartzite				Chert				Chalcedony				Argillite				Total	
	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	No.	%
Size Grade																										
>1"	0	0	0		5	0	5		0	0	0		0	0	0		0	0	0		0	0	0		5	9.6
1/2"-1"	0	2	2		3	1	4		1	1	2		2	0	2		0	0	0		9	0	9		19	36.5
1/4"-1/2"	0	7	7		0	1	1		0	8	8		0	5	5		0	1	1		1	1	2		24	46.2
<1/4"	0	0	0		0	0	0		0	1	1		0	1	1		0	1	1		1	0	1		4	7.7
Total	**0**	**9**	**9**	**17.3**	**8**	**2**	**10**	**17.3**	**1**	**10**	**11**	**21.2**	**2**	**6**	**8**	**15.4**	**0**	**2**	**2**	**3.9**	**11**	**1**	**12**	**23.0**	**52**	**100**
Flake Type (Ahler 1997)																										
Shatter	0	1	1		0	0	0		0	7	7		1	6	7		0	1	1		1	1	2		18	34.6
Simple	0	7	7		6	2	8		1	3	4		1	0	1		0	1	1		10	0	10		31	59.6
Complex	0	0	0		2	0	2		0	0	0		0	0	0		0	0	0		0	0	0		2	3.9
Bifacial Thinning	0	1	1		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		1	1.9
Total	**0**	**9**	**9**	**17.3**	**8**	**2**	**10**	**17.3**	**1**	**10**	**11**	**21.2**	**2**	**6**	**8**	**15.4**	**0**	**2**	**2**	**3.9**	**11**	**1**	**12**	**23.0**	**52**	**100**
Cortex																										
Present	0	2	2		2	2	4		0	0	0		1	1	2		0	0	0		1	0	1		10	17.3
Absent	0	7	7		6	0	6		1	10	11		1	5	6		0	2	2		10	1	11		54	82.7
Total	**0**	**9**	**9**	**17.3**	**8**	**2**	**10**	**17.3**	**1**	**10**	**11**	**21.2**	**2**	**6**	**8**	**15.4**	**0**	**2**	**2**	**3.9**	**11**	**1**	**12**	**23.0**	**52**	**100**

occupation of the site, makes it unlikely that they are related to either the subsistence or economy of the site's inhabitants. This shell may simply be from the natural wildlife.

Gastropod Fourteen gastropod samples were collected. Two of the samples were sent to High Plains Macrobotanical Services, Inc. for further analysis (Appendix II). The first (5LA03333.022.056) was recovered from Feature 3, the possible historic privy. The second (5LA03333.022.066) came from Structure 2. Two species of gastropods were identified from these samples. White-Lip Dagger and Multirib Vallonia gastropods were found in the sample. Neither of these species are good climactic indicators. Both are terrestrial gastropods that live in conditions ranging from dry to damp. They are found in grasslands, shrublands, and woodlands (Bach 2004).

Charcoal Charcoal samples were collected regardless of the perceived temporal affiliation of the structures or features and their associated test units. Although 15 charcoal samples were collected from the site, none were sent for further analysis. Most had a probable historic origin or were considered too small or incapable of providing accurate dating information regarding the prehistoric component at this site.

Conclusions

Historic documentation demonstrates that 5LA3333 is associated with two families important to the homesteading history in the area from the 1920s to 1983; the Mincics and the Saters. However, this site holds little potential to add additional information to that already gained through prior documentation of the original Mincic homestead (Friedman 1985; Loendorf and Clise 1997).

The results of testing at this site indicate that historic and prehistoric cultural materials are present but their potential to yield significant information to the area's history and prehistory is low. Discounting unidentifiable metal fragments, subsurface artifacts were minimal. Artifacts were found as deep as 40 cm below the surface, but erosion and bioturbation have extensively damaged the integrity of the site. Evidence including the stone enclosures and the probable dam around the spring, indicate that this site was used for ranching/herding purposes. The stove legs observed on the ground surface, the porcelain fragments recovered from near Structure 4 and the suggestion of a roof over Structure 4 give some indication that this may have been a habitation structure; however, there is little evidence of long-term use. It remains unclear how the structures and features were used by the members of the Sater or Mincic families. Both historic and prehistoric occupation are likely related to the spring, but the seemingly short-term occupations by both may indicate the unreliability of this water source over time.

Prehistoric artifacts are sparse and indicate that at least some food preparation, lithic reduction, and possible hunting took place at the site. Although one large projectile point was recovered from the subsurface, the surrounding stratigraphy suggests the area has been subject to fairly extensive slope wash and bioturbation. Other prehistoric artifacts from the surface

and subsurface are sparse and they lack contextual integrity. They were not associated with features or with a buried cultural horizon.

Management Recommendation

The dearth of substantial subsurface deposits and the deteriorated condition of the historic structural components indicate a lack of potential for integrity and/or additional significant research potential. The level of testing conducted at this site is believed to be sufficient to determine that the site does not hold the potential to yield additional information significant to the history or prehistory of the PCMS. This site is not recommended as eligible for inclusion in the NRHP and no further work is recommended.

CHAPTER 7
SITE 5LA4417

Introduction

Site 5LA4417 encompasses an area of 35,325 square meters or 8.73 acres and is located on the Stage Canyon 7.5' United States Geological Survey quadrangle (Figure 7.1, locational map).The site is at an elevation of 1505 m (4940 ft) above sea level (asl) in a scattered juniper stand at the headwaters of a unnamed, north flowing tributary to Red Rock Canyon. Much of the site area is deflated to the sandstone bedrock, the result of sheet wash and wind erosion. Small pockets of eolian deposits occur among the junipers and the bedrock exposures. Other vegetation at the site includes snakeweed, sage, and yucca (Figure 7.2).

The site was first identified in 1987 by Larson-Tibesar Associates and Centennial Archaeology. At this time a midden/thermal feature (Feature 1), two non-portable metates (Feature 2 and Feature 3), and two prehistoric structures, Feature 4 and Feature 5 (Room 1 and Room 2), were recorded. Larson Tibesar Associates and Centennial Archaeology also noted, but did not document, a historic component. Reevaluation of the site by New Mexico State University (NMSU) archeologists in 2003 yielded another prehistoric structure (Feature 6).

When the site was first recorded, it was identified in two different survey quadrants. The collection strategies employed in the two quadrants differed. All observed artifacts were collected in the western quadrant and a sample of artifacts was collected in the adjacent quadrant. The sample consisted of 20 m long x 2 m wide transects spaced 20 m apart. The artifacts collected include two pieces of a glass insulator, fragments of six projectile points, one biface fragment, four flake tools, one core, four manos, one chopper/scraper, and eighty-one flaked lithics. Lithic raw material types consisted of quartzite, chert, argillite, and basalt (Sant and Kalasz 1987). The site form suggests that two points had basal notches, two points had corner notches, and the other two fragments could be from side-notched points.

Based primarily on the projectile point styles, the prehistoric component was dated from between AD 200 to AD 1400 or the Early to Middle Ceramic Periods (Eighmy 1984). This time period corresponds to the Late Prehistoric stage, AD 100 - 1725, (1850 - 225 BP) of Zier and Kalasz (1999). In addition, several tin cans and at least one glass insulator fragment were dated to 1867 - 1930, the historic settlement period. The site was recommended as potentially eligible for protection by the NRHP (Sant and Kalasz 1987) based on the presence of architectural features and possible *in situ* deposits of at least 50 cm in depth with high research potential to address questions of subsistence/settlement and organizational dynamics for the Early to Middle Ceramic,

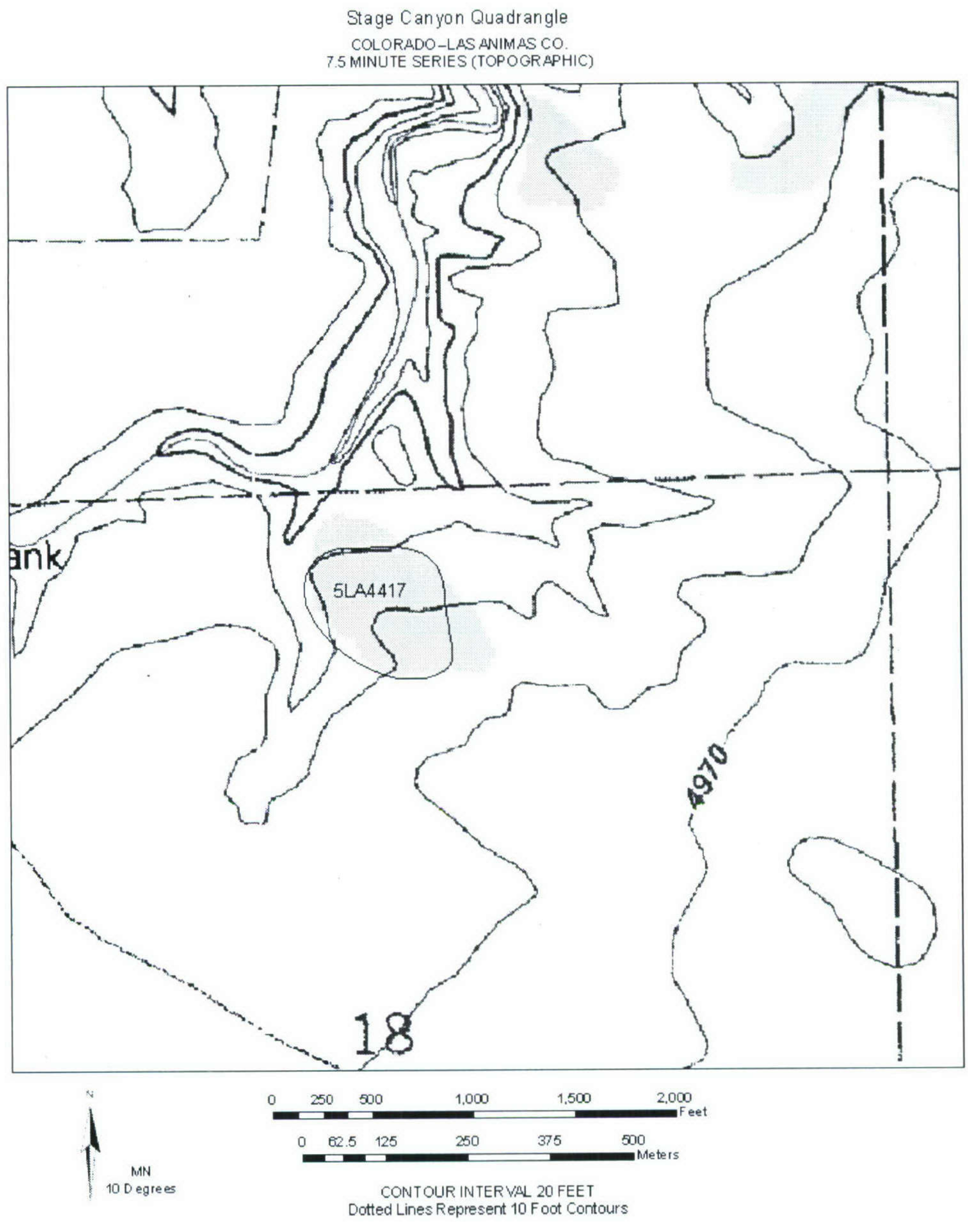


Figure 7.1. Location map, 5LA4417, PCMS.

Figure 7.2. Site overview, 5LA4417. View is to the north.

Periods. Despite this MNSU's 2003 revaluation, citing significant alluvial and colluvial erosion, estimated sediment depth to be less than 5 to 10 cm within the stone structures (Chidley 2003) and recommended the site as ineligible for inclusion in the NRHP.

Surface Investigation

Surface investigations at this site by FLC consisted of completing a topographical map using the Total Station as well as mapping the site boundaries, all recorded cultural features, the distribution of surface artifacts and the location of all subsurface tests (Figure 7.3 and 7.4). The main datum was designated as 100mN, 100mE, at an elevation of 100 m. Six temporary subdatums were used to facilitate site mapping. In addition, an organized survey was completed by walking transects in 10 m intervals across the site. Three projectile points, four portable groundstone pieces, one drill, one biface, and five flaked tools were collected. Eighty-eight lithic flakes, one hornfels/basalt core, four non-portable groundstone fragments were mapped and field analyzed. Five of the six original features were relocated. Feature 3, a bedrock metate, was not relocated. Five additional features (Features 7 - 11) were identified and recorded by FLC.

Features

Feature 1

This feature was originally mapped as a circular, 4 m x 4 m concentration of

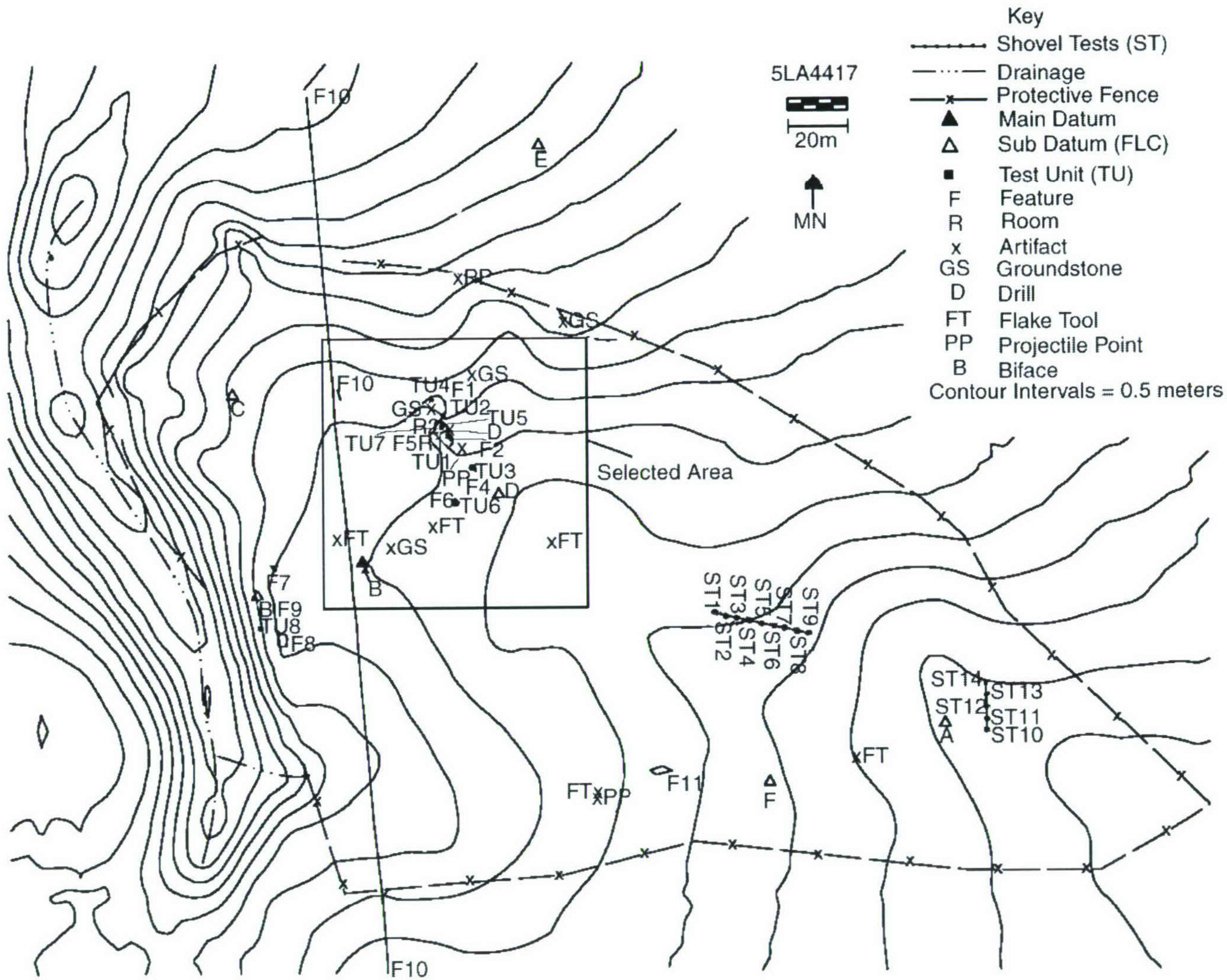


Figure 7.3. Site map, 5LA4417.

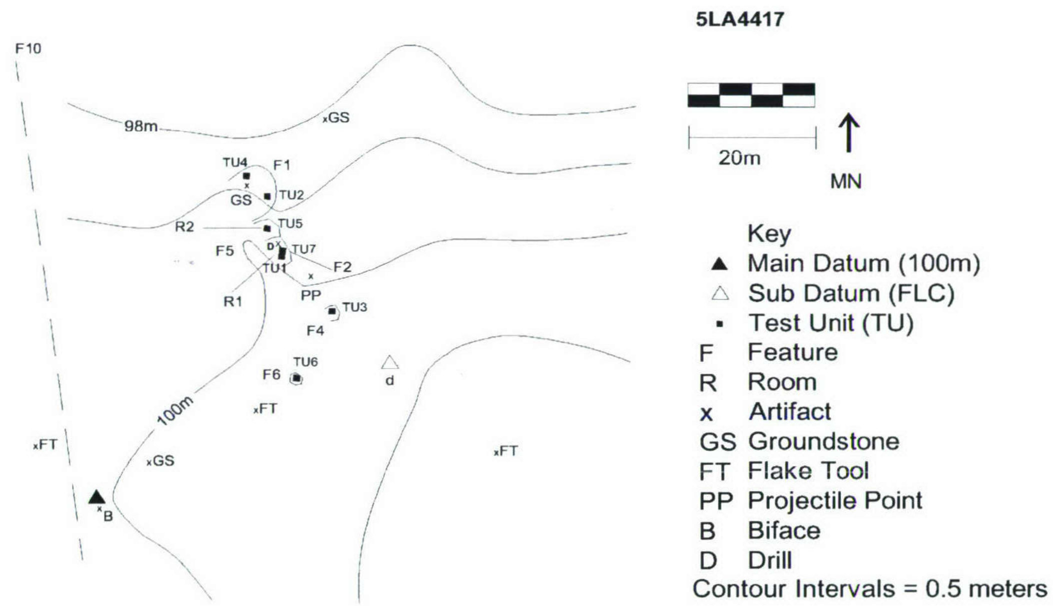


Figure 7.4. Site map, 5LA4417. Selected area marked on Figure 7.3.

heat-altered sandstone gravels, pebbles, and cobbles in a gray, ashy soil matrix. In 1987 burned bone fragments and lithic debitage were noted around the feature's periphery. This feature was identified as a roasting pit (Sant and Kalaz 1987) because of its size and visible cultural material. Sediment depth was estimated to be at least 50 cm, although rodent burrowing and erosion in a small drainage to the east were noted as possible threats to the integrity of the feature. When NMSU visited the site in 2003, the feature was described as being heavily deflated with little potential to provide further archaeological information.

Feature 2

Feature 2 was originally recorded as a sandstone slab metate located within Feature 5, Room 1. The metate measures 27 cm x 21 cm x 10 cm. The grinding surface is 27 cm x 18 cm with some longitudinal striations. A small (5 cm x 3 cm) area of polishing with some pecking in the central grinding area was noted.

Feature 3

This quartzitic sandstone block metate (44 cm x 24 cm x 15 cm) was originally recorded as having an oval grinding surface measuring 20 cm x 15 cm. Moderate smoothing and pecking were also noted. Feature 3 was not relocated by FLC.

Feature 4

Feature 4 is an isolated, fully-enclosed architectural unit abutting a dipping sandstone exposure (Figure 7.5, Figure 7.6). The semi-circular wall is constructed from locally available sandstone slabs and blocks. Feature 4 measures 4.5 m x 2.7 m. The wall

Figure 7.5. Feature 4, 5LA4417.

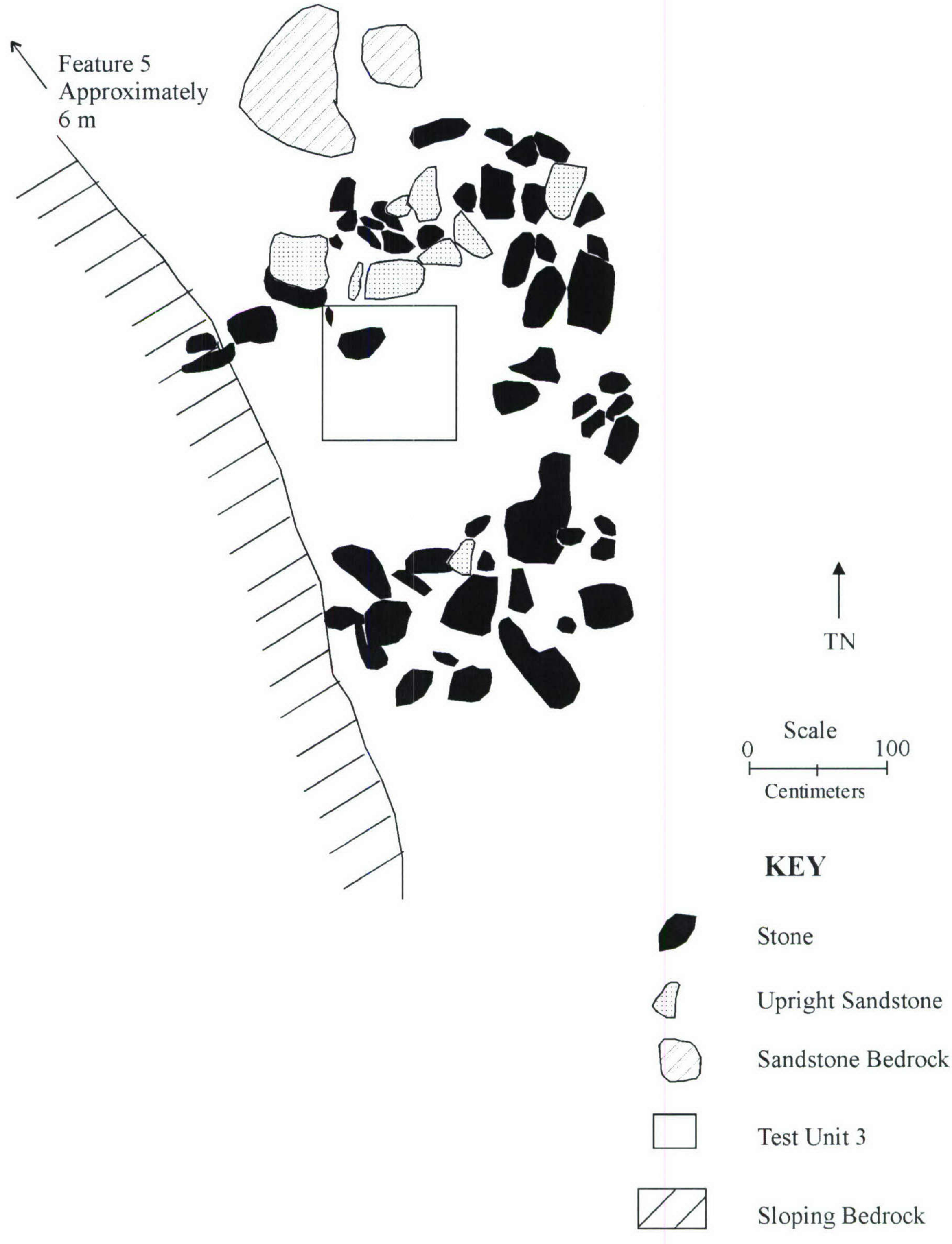


Figure 7.6. Feature 4 plan view, 5LA4417.

is characterized by horizontal and upright slabs; buttressing or "shim" rocks are apparent in several instances. Based on its size and complexity, Feature 4 was originally interpreted as a prehistoric habitation structure.

Feature 5

Approximately six meters to the north of Feature 4 and abutting the same dipping sandstone is Feature 5. It consists of a two partially enclosed rooms (Figure 7.7). It was originally described as a prehistoric habitation structure constructed with upright slabs and horizontally stacked slabs and blocks. Buttressing rocks were also apparent in a few instances. The entire feature measures approximately 6 m x 3.5 m. Room 1 is more clearly defined than Room 2, which lies to the north, and the wall between the two rooms is difficult to detect. A gray, ashy midden area extended from the wall area due east for approximately 1.5 - 2 m.

Feature 6

Feature 6 is an oval-shaped, prehistoric structure, possibly associated with the Apishapa archaeological phase. The feature is constructed from unmodified sandstone slabs and measures 5 m x 4 m x 5 cm.

Feature 7

Feature 7 is located on a bedrock outcrop along a north-south trending, unnamed drainage that flows into Red Rock Canyon. The feature consists of a large sandstone slab, approximately 1.7 m x 1.1 m x 0.15 m, with smaller pieces of sandstone rocks piled above and below it (Figure 7.8). The large slab is propped up about 42 cm off the ground with four smaller rocks (20 - 30 cm thick). No artifacts are associated with this feature, no temporal affiliation is designated and its function is unknown.

Feature 8

Feature 8 consists of a 4 m x 3 m pile of sandstone built up between two large sandstone boulders and located directly on top of bedrock. The rocks appear to have been built as a possible wind break or hunting blind; however, there are no associated artifacts and no temporal affiliation is designated.

Feature 9

This feature consists of a 72 cm x 72 cm, dark soil stain on a southwest-facing slope above the unnamed drainage that flows into Red Rock Canyon. It is possible that slope wash from the habitation area above contributed to this stained area. The staining is located near a small rock overhang that lies to the east and a bone concentration to the south. Although no charcoal was found at the surface, it was believed Feature 9 could represent a shallow hearth with little subsurface deposits.

Feature 10

Feature 10 consists of a line of 18 sandstone boulders with wires wrapped around them (Figure 7.9) placed between 10 m to 30 m apart in a line running north-south. Interspersed along this line are three cut juniper posts. At least one green insulator was

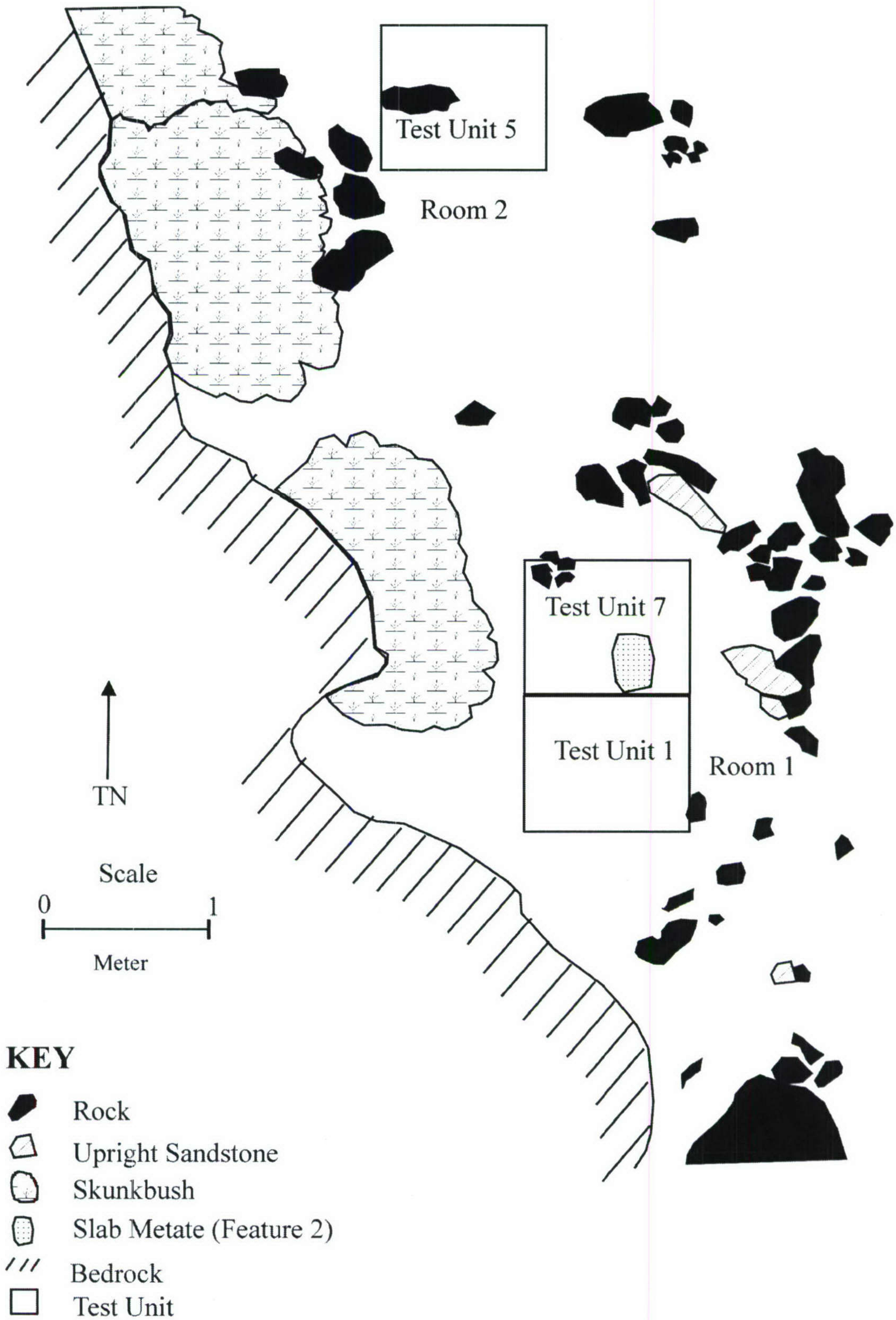


Figure 7.7. Feature 5 plan view, 5LA4417.

Figure 7.8. Feature 7, 5LA4417.

Figure 7.9. Feature 10, 5LA4417.

found in association with this feature. It is identified as a Hemingray-10 telephone insulator. This artifact suggests that the feature may have been associated with a historic telephone line.

Feature 11

This historic feature consists of a large post with two boards at the top. Metal encircles the boards. An alignment of three large upright sandstone blocks and four prone sandstone blocks compete the feature. No artifacts were located in the vicinity of this feature. Although its function is unknown, its proximity to Feature 10 may indicate an association between the two features.

Subsurface Testing

Fourteen shovel test pits (STP) were completed in order to investigate the eastern portion of the site where no architectural features were identified. In addition, a total of eight 1 m x 1 m units were excavated. All eight units were placed to test for intact subsurface deposits in areas identified as features. Three 1 m x 1 m units were excavated in Feature 5, originally identified as a prehistoric habitation structure. Test Unit 1 was opened to investigate the possibility for subsurface deposits in Feature 5, Room 1. At the discovery of a charcoal-stained area in Test Unit 1, Test Unit 7 was opened adjacent to Test Unit 1. Test Unit 5 was positioned in Feature 5, Room 2. One feature was discovered during the excavation of Test Units 1 and 7. The fill from this thermal feature, designated Feature 12, was removed and processed as a flotation sample. Two units, Test Unit 2 and Test Unit 4, were placed in the midden identified as Feature 1. Test Unit 3 was positioned inside the walls of Feature 4, which is also believed to be a prehistoric architectural feature. Test Unit 6 was placed within Feature 6, interpreted by previous investigators as an Apishapa habitation structure (Chidley 2003). The final unit, Test Unit 8, examined dark stained area of Feature 9.

Shovel Tests

Two lines of shovel test pits - STP 1 - 9 and STP 10 - 14 were placed to the east of the features in order to determine whether subsurface cultural deposits were present in other areas of the site (Figure 7.3). Shovel test pits ranged in depth from 30 cm to 72 cm with an average depth of 54 cm. Bedrock was encountered in five of the shovel tests at a depth between 32 - 58 cm. No artifacts were collected from this phase of subsurface testing. See Appendix V for complete shovel test results.

Test Units

Test Unit 1

This unit was placed in Feature 5, Room 1 (Figure 7.10). Test Unit 1 datum was placed at 140.40mN, 129.11mE, at an elevation of 0.31 mbsd for an arbitrary elevation of 99.69 m. The unit was excavated in three layers to a final depth of between 24 and 29 cm bgs. Excavated as a single stratigraphic layer, Layer 1 was a thin (2 to 4 cm) layer of

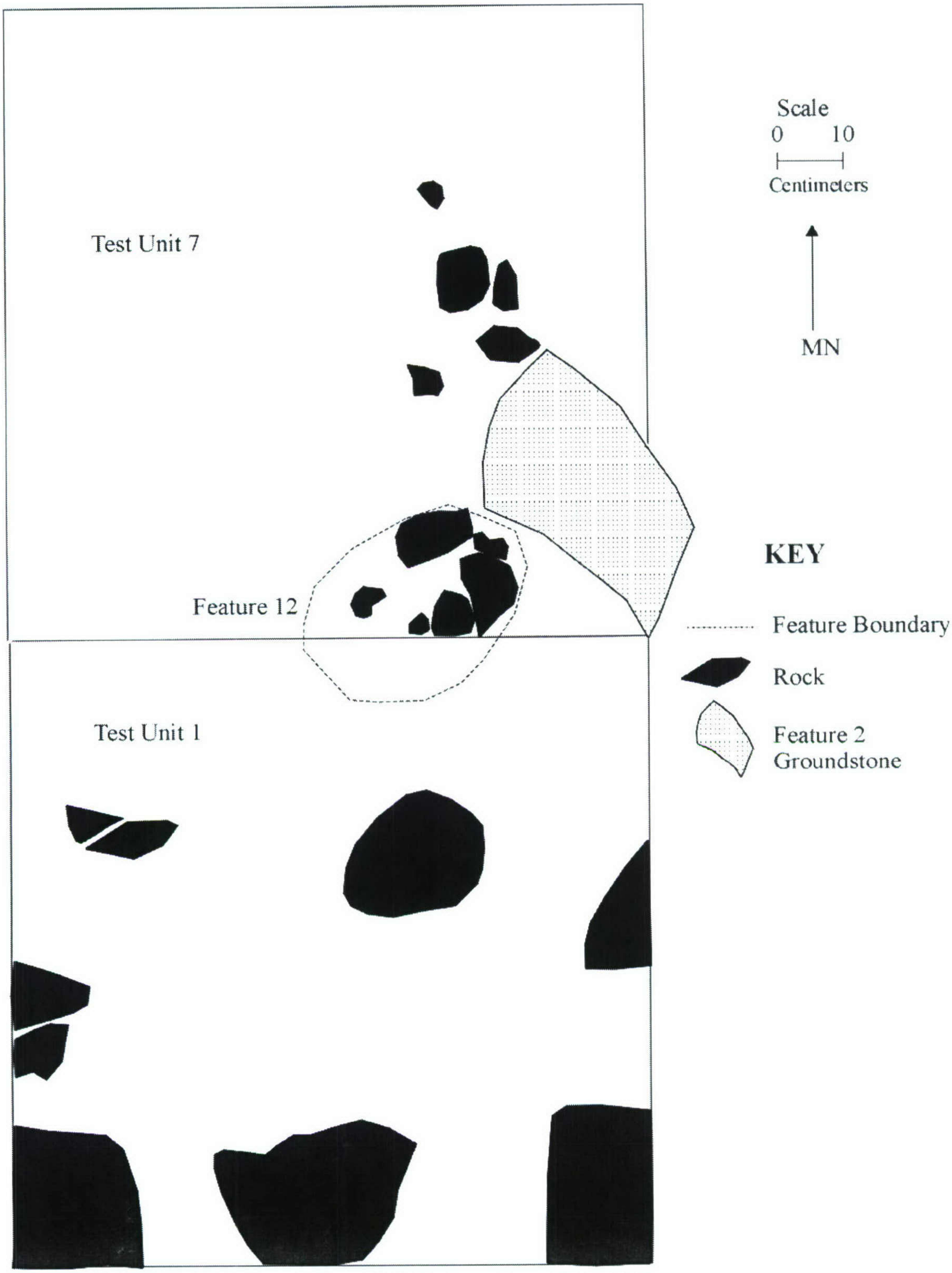


Figure 7.10. Test Unit 1 and Test Unit 7 plan view, 5LA4417.

very loose overburden with sandstone gravels, pebbles, and cobbles. A layer change was made when sediments became darker and more moist; no artifacts were recovered.

Layer 2 was excavated in two levels that ranged from 7 to 16 cm thick. A sandstone slab metate, a projectile point base, lithic flakes, bulk bone, and charcoal were recovered from Layer 2, mostly from the control samples (Table 7.1). Excavation of Layer 2 was halted at the discovery of an area in the northern portion of the test unit with dark soil, fire-cracked rock, and one burned bone. At this time, another 1 m x 1 m unit, Test Unit 7, was placed abutting the north wall of Test Unit 1. Excavation in Test Unit 1 was postponed while work in Test Unit 7 uncovered the northern boundary of this charcoal-stained area. After this thermal feature (Feature 12) was identified, mapped, and excavated. Work in Test Unit 1 continued with the removal of Layer 3.

Table 7.1. Test Units 1, 5, and 7 artifact summary, 5LA4417.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
1	Layer 1	*	2 - 4 cm	None	1 macrobotanical sample
1	Layer 2	Level 1	1 - 10 cm	1 groundstone fragment	5 flaked lithic artifacts, 2 bulk bone, 1 charcoal sample
1	Layer 2	Level 2	6 - 8 cm	1 flake tool, 1 bulk bone	6 flaked lithic artifacts, 1 projectile point fragment, 5 bulk bone, 1 charcoal sample
1	Layer 3	*	8 - 10 cm	None	1 flaked lithic artifact, 4 bulk bone, 1 charcoal sample
5	Layer 1	*	2 - 5 cm	None	1 macrobotanical sample
5	Layer 2	Level 1	5 - 10 cm	1 flake tool	1 macrobotanical sample
5	Layer 2	Level 2	4 - 9 cm	2 flaked lithic artifacts, 1 flake tool, 4 bulk bone	5 flaked lithic artifacts, 25 bulk bone, 1 charcoal sample, 1 macrobotanical sample
5	Layer 2	Level 3	8 - 16 cm	1 charcoal sample	6 flaked lithic artifacts, 1 flake tool, 1 bone bead, 136 bulk bone, 1 charcoal sample, 1 macrobotanical sample, 1 gastropod sample
7	Layer 1	*	2 - 3 cm	1 groundstone fragment, 1 flaked lithic artifact	2 flaked lithic artifacts, 1 bulk bone, 1 charcoal sample, 1 macrobotanical sample
7	Layer 2	*	2 - 10 cm	1 flaked lithic artifact	1 flaked lithic artifact, 1 charcoal sample
7	Layer 3	Level 1	8 - 9 cm	None	2 flaked lithic artifacts, 1 charcoal sample
7	Layer 3	Level 2	0 - 11 cm	None	1 bulk bone

* Excavated as a single stratigraphic layer

Layer 3 was excavated in Test Unit 1 as a single stratigraphic layer that ranged in thickness from between 8 and 10 cm before ending at bedrock. The layer was primarily composed of dark grayish brown sediments and decomposing bedrock. Bulk bone, a lithic flake, and a charcoal sample were collected from the control sample.

<u>Test Unit 7</u>

The test unit datum was the same as that used for Test Unit 1. Test Unit 7 was also excavated in three layers. Layer 1 was a 2 to 3 cm thick, light brown layer of loose sediments containing poorly sorted sandstone pebbles and cobbles. Three lithic flakes, one groundstone fragment, one bulk bone, and charcoal were collected from Layer 1.

A layer change was quickly indicated as sediments became darker. A dark charcoal stain appeared in the southern portion of the test unit during the excavation of Layer 2 which, like Layer 1, was excavated as a single stratigraphic layer. Layer 2 ranged in thickness from 2 to 10 cm. Flaked lithic artifacts and a charcoal sample were collected from Layer 2. The slab metate previously designated Feature 2 also rested near the bottom of this layer. The charcoal stained area (Feature 12) was mapped and removed as two floatation samples, Feature 12 North half and Feature 12 South half. After the removal of Feature 12 the dark brown sediments and decomposing bedrock of Layer 3 were excavated in two levels (9 - 20 cm) before bedrock was encountered at a final depth of between 18 and 29 cm bgs. Two flaked lithic artifacts, a bulk bone, and a charcoal sample were collected.

Three strata were identified in the profiles of the north-facing south wall of Test Unit 1, the south-facing north wall of Test Unit 7 and the two-meter long profile of the west-facing east wall of Test Unit 1 and Test Unit 7 (Figure 7.11). These strata are described below.

Stratum I — Stratum I is a thin layer (2 to 8 cm thick) of grayish brown (10YR 5/2) to dark grayish brown (10YR 7/2), fine to medium clay loam. The sediments are single grained and the lower boundary of the layer is abrupt and smooth. No calcium carbonate is present. The matrix includes 8% poorly sorted sandstone pebbles and cobbles and shows bioturbation from rodents, roots, and insects. Cultural materials were recovered from this stratum.

Stratum II — Stratum II is a layer of loam with a clear, smooth, lower boundary. The sediments are a dark grayish brown (10YR 4/2) with a moderately well-developed structure and are made up of 10% poorly sorted sandstone pebbles to boulders. No calcium carbonate is present. Cultural materials were collected from this 13 - 24 cm thick layer.

Stratum III — Stratum III is 1 to 6 cm thick and is composed of 40 to 60% sandstone cobbles and boulders that easily break off from the bedrock. No calcium carbonate is present. Since this layer consists primarily of large pieces of

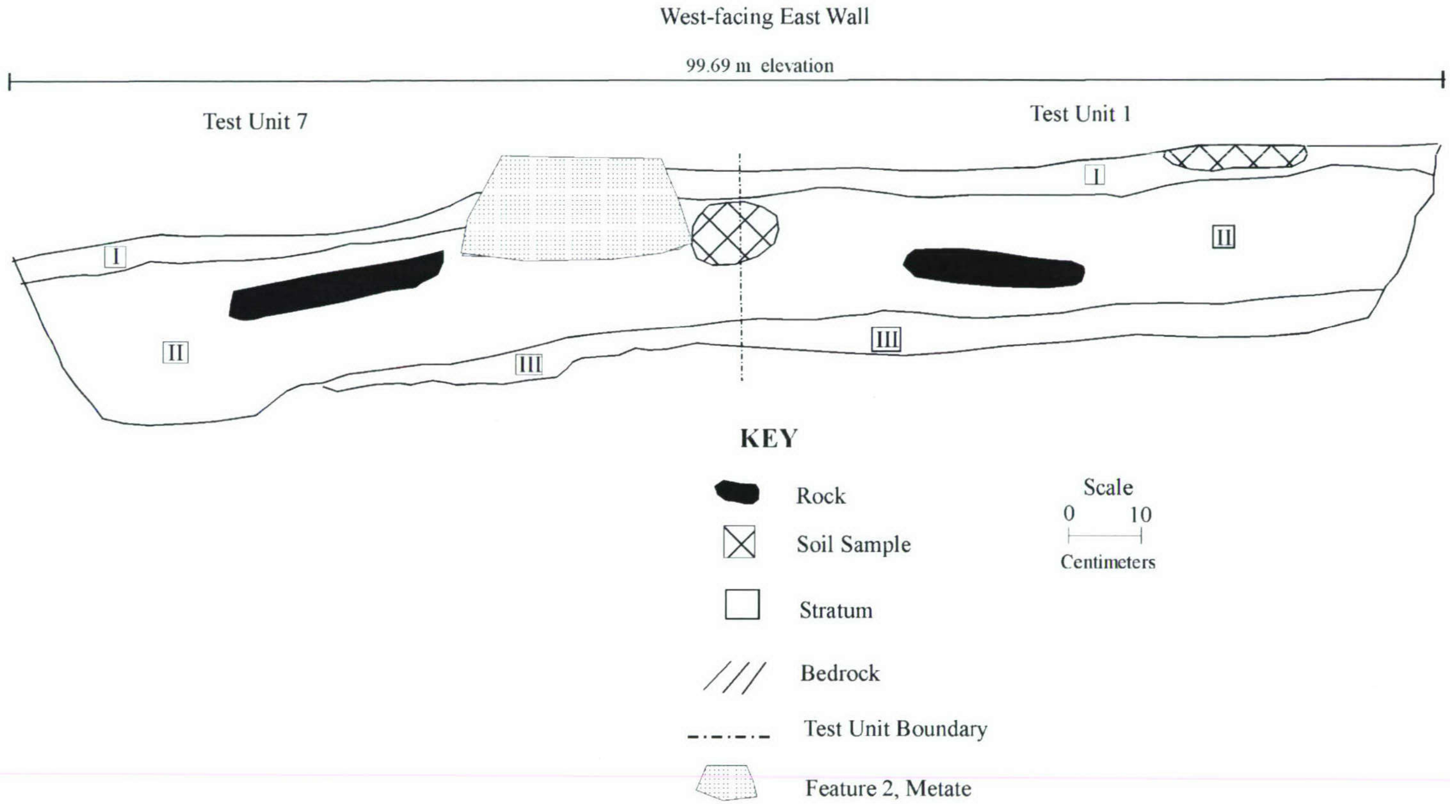


Figure 7.11. East wall profile, Test Units 1 and 7, 5LA4417.

broken bedrock, no additional sediment description was completed. No soil sample was taken. Cultural materials were collected from this stratum.

<u>Feature 12</u>

Feature 12 appeared as a 28 cm x 30 cm dark stain (Figure 7.12) in the northern portion of Test Unit 1 and the southern portion of Test Unit 7 (Figure 7.10). One lithic flake and one burned bone were removed from near the surface of this feature. The sediments were collected as a flotation sample. No artifacts were recovered from these samples; however, the sediments consisted of a high percentage of fire-cracked rocks and charcoal. The shallow feature was basin-shaped and reached a depth of 5 cm, at its deepest point. No *in situ* oxidation was observed. In fact, the difference between the fill within the feature and the sediments of the test units was difficult to discern although

Figure 7.12. Feature 12, 5LA4417.

Feature 12 did contain more charcoal than Layer 2 of Test Units 1 and 7. Although Feature 12 has been categorized as a thermal feature based primarily on the presence of fire-cracked rocks, it is also possible that it was simply a low area within the structure that was filled through slope wash.

Charcoal collected from the processed flotation samples from Feature 12 was submitted for standard radiocarbon dating. The sample returned a conventional radiocarbon age of 940 +/- 60 BP (Beta 192258). The 2 sigma calibrated calendar date is AD 990 - 1230; the intercept of radiocarbon age with calibration curve is AD 1040.

The fill from Feature 12 ranged from 1 to 5 cm thick. Sediments were a very dark gray (10YR 3/1), sandy clay loam with a blocky, moderately developed structure. The matrix was bioturbated by roots and included 5% angular, poorly sorted sandstone pebbles. Sediments did not react to hydrochloric acid. Charcoal was recovered from the fill. No cultural material was recovered from the feature fill.

Test Unit 5

Test Unit 5 was positioned within Feature 5, Room 2 and was excavated in two stratigraphic layers that ended at bedrock. The unit datum was set at 146.56mN, 127.09mE with an elevation of 0.56 mbsd for an arbitrary elevation of 99.44 m. The control unit was placed in the southwest corner of the unit. Layer 1 was a 2 to 5 cm thick layer composed primarily of organic materials, sandy sediments and several large sandstone slabs that may be cultural. No cultural materials were collected from Layer 1. Layer 2 was excavated in three levels and ranged in total thickness from between 22 and 31 cm. The layer had a high percentage of small roots, sandstone pebbles, gravels, cobbles, and boulders. Flaked lithic artifacts, a bone bead, bulk bone, two flake tools, and a small amount of charcoal, gastropods, and microbotanical remains were recovered from Layer 2 (Table 7.1). Most of the cultural material was collected from the control samples. Sandstone slabs were also found in this layer, a number of them upright, and may represent wall fall from the surrounding feature (Feature 5). Excavation was terminated when bedrock was reached at a depth of between 24 - 36 cm bgs.

Two strata were identified in the south-facing north wall and the east-facing west wall of Test Unit 5 and are described below (Figure 7.13).

Stratum I — Stratum I ranges in thickness from 4 to 10 cm. It consists of bioturbated grayish brown (10YR 5/2), single grained sandy clay loam. Sediments are made up of 15 to 20% poorly sorted, angular gravels. The lower boundary is clear to gradual and smooth. The sediments exhibit no reaction to hydrochloric acid. No cultural materials were recovered from Stratum I.

Stratum II — Stratum II is a 19 to 28 cm thick layer of dark grayish brown (10YR 4/2) loam to clay loam. The sediments are weakly developed and blocky. The lower boundary is clear to gradual and smooth. Like in the stratum above, sediments exhibit signs of bioturbation and display no reaction to hydrochloric acid. The matrix is composed of 60 to 80% poorly sorted angular gravels. Cultural material was collected from this layer which ended at bedrock.

Feature 5 most likely represents the remains of a seasonally occupied or temporary structure. Testing revealed cultural deposits in the structure but deposition is rather shallow. Lithic reduction and food preparation in or near Feature 5 is suggested by the presence of lithic artifacts and groundstone.

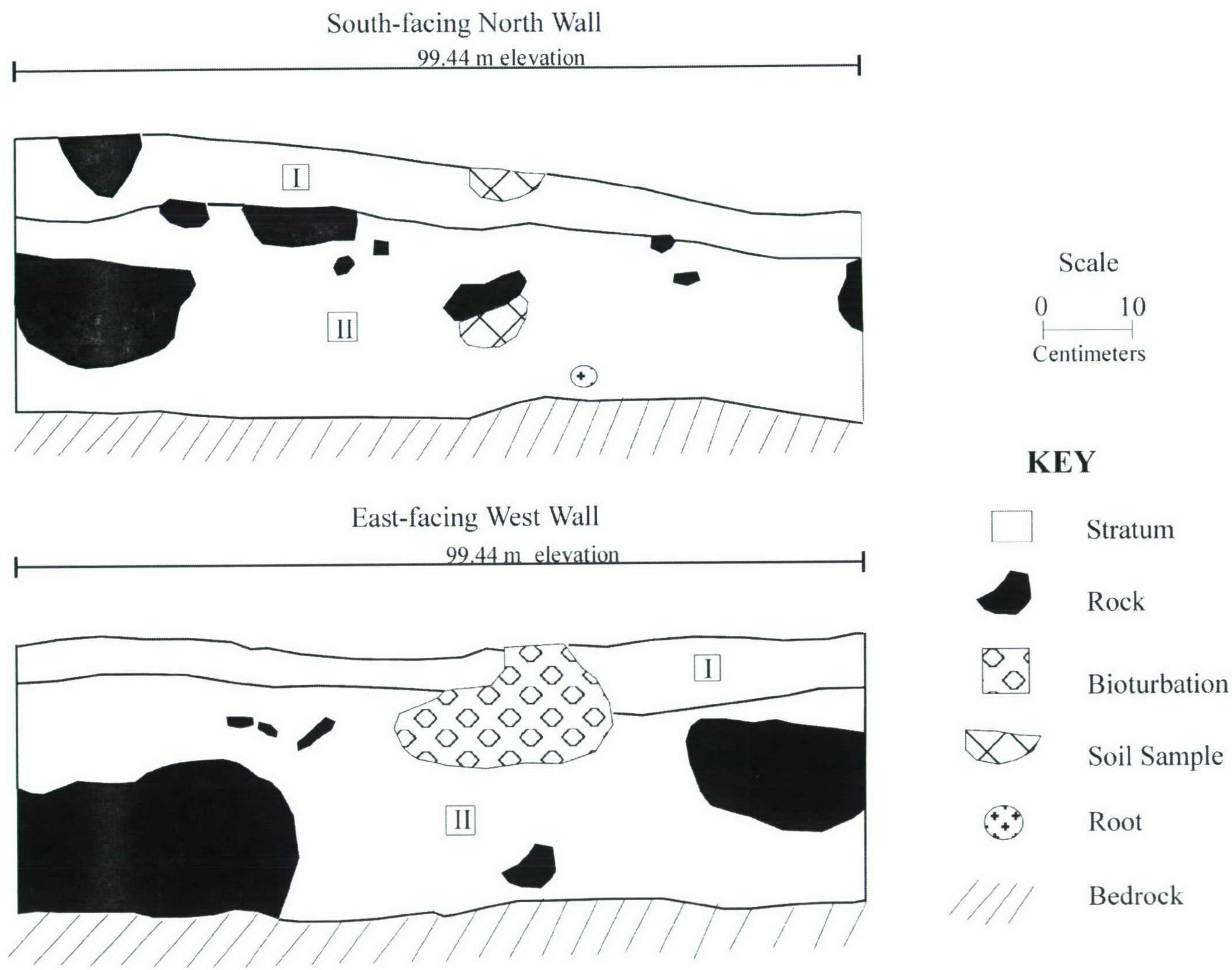


Figure 7.13. North wall profile and west wall profile, Test Unit 5, 5LA4417.

Test Unit 2

Feature 1, the midden area, was tested through the excavation of Test Units 2 and 4. Excavations reached a depth of between 22 and 34 cm bgs in Test Unit 2 and between 10 and 20 cm bgs in Test Unit 4 before bedrock was encountered. Test Unit 2 was excavated in two stratigraphic layers. The unit datum was placed at 150.58mN, 126.40mE, at an elevation of 1.07 mbsd for an arbitrary elevation of 98.93 m.

Layer 1 was excavated in two levels and consisted of loose sediments with a high percentage of fire-cracked sandstone blocks and pebbles. A flake tool and bulk bone were recovered from Layer 1 (Table 7.2) which ranged in thickness from between 10 to 13 cm. A layer change was indicated as the sediments became more structured. Layer 2 was excavated in three levels and ranged in thickness from between 10 and 21 cm. Much of the matrix was composed of fire-cracked rock. Charcoal pieces increased in size and in amount as the unit became deeper. Bulk bone, charcoal, gastropods, and microbotanical remains were collected from this layer. Excavation of Test Unit 2 terminated at bedrock.

Table 7.2. Test Units 2 and 4 artifact summary, 5LA4417.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
2	Layer 1	Level 1	1 - 9 cm	1 flaked lithic tool, 1 bulk bone	1 bulk bone, 1 macrobotanical sample
2	Layer 1	Level 2	6 - 10 cm	1 bulk bone	5 bulk bone, 1 charcoal sample, 1 macrobotanical sample
2	Layer 2	Level 1	2 - 10 cm	10 bulk bone	8 bulk bone, 1 charcoal sample, 1 macrobotanical sample
2	Layer 2	Level 2	7 - 10 cm	None	8 bulk bone, 1 charcoal sample, 1 macrobotanical sample, 1 gastropod sample
2	Layer 2	Level 3	0 - 3 cm	None	2 bulk bone, 1 charcoal sample, 1 macrobotanical sample
4	Layer 1	Level 1	0 - 10 cm	1 flaked lithic artifact, 4 bulk bone	8 bulk bone
4	Layer 1	Level 2	0 - 10 cm	2 bulk bone, 1 geofact, 1 charcoal	1 flaked lithic artifact, 7 bulk bone, 1 macrobotanical sample
4	Layer 1	Level 3	0 - 10 cm	None	None

Charcoal collected from Test Unit 2, Layer 2, Level 2 was submitted for AMS radiocarbon dating. The sample (Beta-192259) yielded a conventional radiocarbon age of

10 +/- 40 BP. The 2 sigma standard calibrated calendar date is AD 1020 - AD 1220 with the intercept of radiocarbon age with calibration curve at AD 1160.

Two strata were identified in the west-facing east wall of Test Unit 2 (Figure 7.14); three strata were identified in the south-facing north wall profile of the unit and are described below.

Stratum I — Stratum I is a dark grayish brown (10YR 4/2), 2 to 8 cm thick layer of medium to coarse loam with a clear and smooth lower boundary. The sediments are composed of 50 to 70% poorly sorted pebbles, are bioturbated primarily from roots and exhibit a slight reaction to hydrochloric acid. A small amount of cultural material was recovered from Stratum I.

Stratum II — Stratum II is a dark grayish brown (10YR 3/2), coarse, single grained clay loam ranging in thickness from 12 to 25 cm. The sediments are subangular and blocky and the matrix is composed of 60 to 70% poorly sorted pebbles to cobbles, many of which are fire-cracked. Charcoal and bulk bone were collected from this layer. The sediments react violently to hydrochloric acid. Stratum II has a clear, smooth, lower boundary with Stratum III. Portions of Stratum II end at bedrock except where Stratum III is present.

Stratum III — This layer of clay loam ranges from 1 to 12 cm thick and is grayish brown (10YR 5/2). The sediments are angular and blocky and include 40 to 60% moderately sorted pebbles and cobbles. Sediments react violently to hydrochloric acid. No cultural materials were recovered from this layer. Stratum III ends abruptly at bedrock.

<u>Test Unit 4</u>

The test unit datum was set at 153.75mN, 123.61mE, at an elevation of 1.03 mbsd for an arbitrary elevation of 98.97 m. During excavation no stratigraphic layer changes were identified and the unit was excavated in three levels, each of which ranged in depth from between 0 and 10 cm. Sediments in Layer 1 were fine-grained and consisted mainly of organic overburden with sandstone pebbles and cobbles. Sandstone rocks became smaller and less prevalent and sediments became lighter with increased depth but bedrock was reached quickly in all but the unit's northeast corner. Excavations were terminated at bedrock, which slopes from southwest to northwest across the unit at a depth of between 10 and 20 cm bgs. Two lithic flakes, a geofact, bulk bone, and charcoal were collected from Test Unit 4, Layer 1 (Table 7.2). No cultural materials were recovered from the final level of excavation.

Two strata were identified in the west-facing east wall and north-facing south wall profiles of Test Unit 4. These strata are illustrated in Figure 7.15 and are described below.

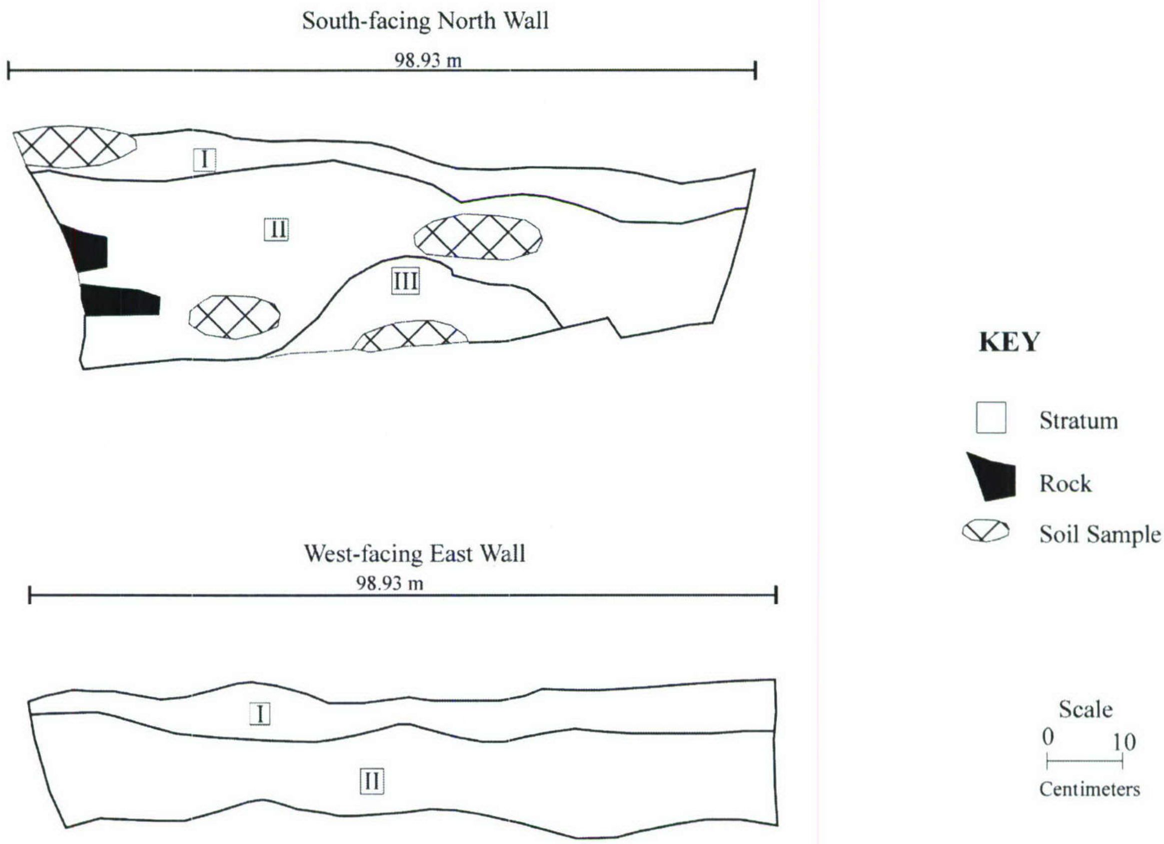


Figure 7.14. North wall profile and east wall profile, Test Unit 2, 5LA4417.

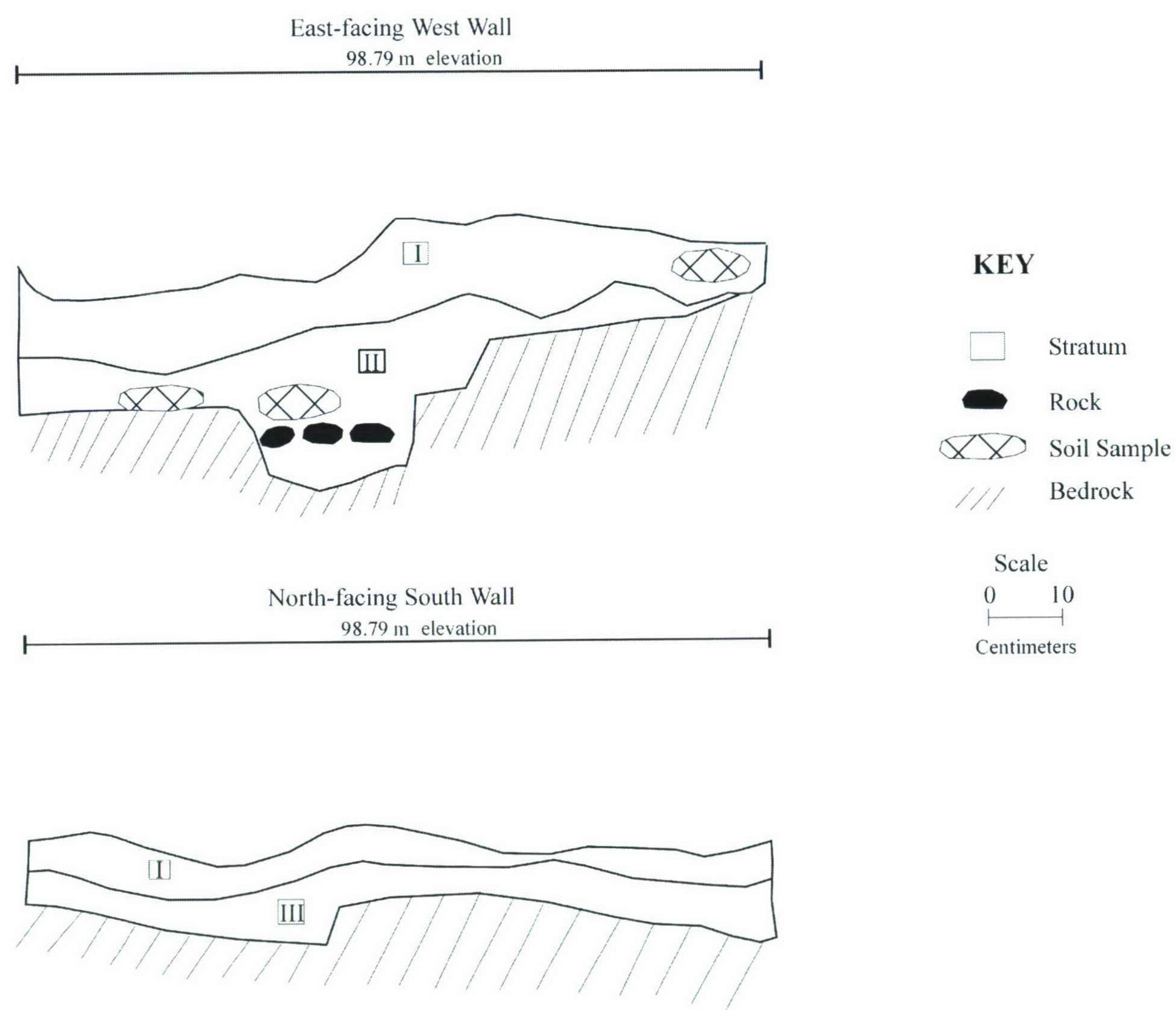


Figure 7.15. West wall profile and south wall profile, Test Unit 4, 5LA4417.

Stratum I Ranging in thickness from 2 to 13 cm, Stratum I is a brown to yellowish brown (10YR 5/3 to 10YR 5/4), medium sized, single grained silt loam. The lower boundary is clear and smooth. Sediments are composed of 20 to 30% poorly sorted pebbles and are bioturbated by roots. Sediments exhibit a slight reaction to hydrochloric acid. Cultural materials were recovered from this stratum.

Stratum II Stratum II is 2 to 21 cm thick and rests on bedrock, creating an abrupt and smooth lower boundary. The sediments are a dark grayish brown (10YR 4/2) loam. Sediment structure is subangular and blocky and weakly developed. The matrix is composed of 30 to 40% poorly sorted pebbles to cobbles. A moderate amount of calcium carbonate is present. Cultural material was recovered from the top 15 cm of Stratum II.

In 1987 Feature 1 was mapped as a 4 m x 4 m roasting pit or midden with *in situ* deposits of at least 50 cm. The reevaluation form completed in 2003 by NMSU, cited heavy erosion as a critical factor causing destruction to the feature. The feature was mapped by FLC as a 10 m x 8 m area and investigated through the excavation of two 1 m x 1 m test units (Test Units 2 and 4). Based on the increased size of the feature, the minimal amount of artifacts recovered and the relatively shallow final depth of the test units, what seems most apparent is that the integrity of the feature has been compromised by erosion. Despite the perceived impact the fire-cracked rock and charcoal encountered during excavation and the burned bulk bone and lithic debitage collected support its original interpretation as a midden.

Test Unit 3

This 1 m x 1 m test unit was placed within Feature 4, a prehistoric architectural structure. The unit was excavated in three layers and reached a final depth ranging from between 23 to 29 cm bgs (Table 7.3). The unit datum was originally placed at 132.18mN, 137.70mE, at an elevation of 0.64 masd at an arbitrary elevation of 100.64 m.

Table 7.3. Test Unit 3 artifact summary 5LA4417.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
Unit 3	Layer 1	*	5 - 10 cm	None	1 macrobotanical sample
Unit 3	Layer 2	*	10 - 12 cm	None	1 charcoal sample, 1 macrobotanical sample
Unit 3	Layer 3	*	0 - 14 cm	None	1 flaked lithic artifact, 1 charcoal sample, 1 macrobotanical sample

* Excavated as a single stratigraphic layer

Layer 1 was excavated as a single 5 to 10 cm thick stratigraphic layer, which consisted mainly of organic material from an adjacent juniper tree. The sediments of Layer 2 were slightly compacted and also constituted a single stratigraphic layer ranging in thickness from 10 to 12 cm. No cultural materials were recovered from Layer 1 or 2. Some small bits of charcoal were noted in Layer 2 but were collected only from the control sample. Layer 3 was 0 to 14 cm thick and consisted primarily of decomposing bedrock. Excavations were terminated when bedrock was reached. No artifacts were recovered from the ¼ in screen. A flaked lithic artifact and a charcoal sample were later recovered from the processed control sample from Layer 3.

Three strata (Figure 7.16) were recorded in the profiles of the south-facing north wall and the north-facing south wall of Test Unit 3.

Stratum I — Stratum I is a dark gray brown to very dark gray brown (2.5YR 4/2 to 2.5YR 3/2) loam to clay loam ranging in thickness from 1 to 7 cm. The medium-sized, single grained to blocky sediments are weakly developed Branches and leaves make up a portion of the sediments and 5% of the matrix is composed of poorly sorted gravels and pebbles. Stratum I is bioturbated mainly by tree roots. The lower boundary is clear and smooth. No calcium carbonate is present. No cultural material was recovered from this stratum.

Stratum II — Stratum II is a 9 to 20 cm thick grayish brown (10YR 5/2) loam to fine silt loam. It is moderately developed and blocky; the lower boundary is abrupt and smooth where Stratum III is present. Where Stratum III is absent Stratum II ends at bedrock. Fifty percent of the matrix consists of gravels. No calcium carbonate is present. One charcoal sample was recovered from this stratum.

Stratum III — Ranging in thickness from 2 to 9 cm, Stratum III is primarily decomposing bedrock. No further soil/sediment description was necessary and no sample was collected. Stratum III ends at bedrock. One lithic artifact and a charcoal sample were recovered from this stratum.

The shallow final depth of this test unit makes it impossible to infer the function or temporal affiliation. There was no evidence that this feature was used as a structure. The very small amount of charcoal was not sent for dating since samples from other test units were larger and would provide better dates.

Test Unit 6

Test Unit 6 was placed to test Feature 6, identified as a possible prehistoric structure. The unit datum was set at 119.75mN, 130.95mE, at an elevation of 0.50 masd for an arbitrary elevation of 100.50 m. During excavation of Layer 2, Level 2 the unit datum was repositioned to 119.69mN, 130.93mE, at an elevation of 0.42 masd for an arbitrary elevation of 100.42 m. The control unit was placed in the northeast corner. The

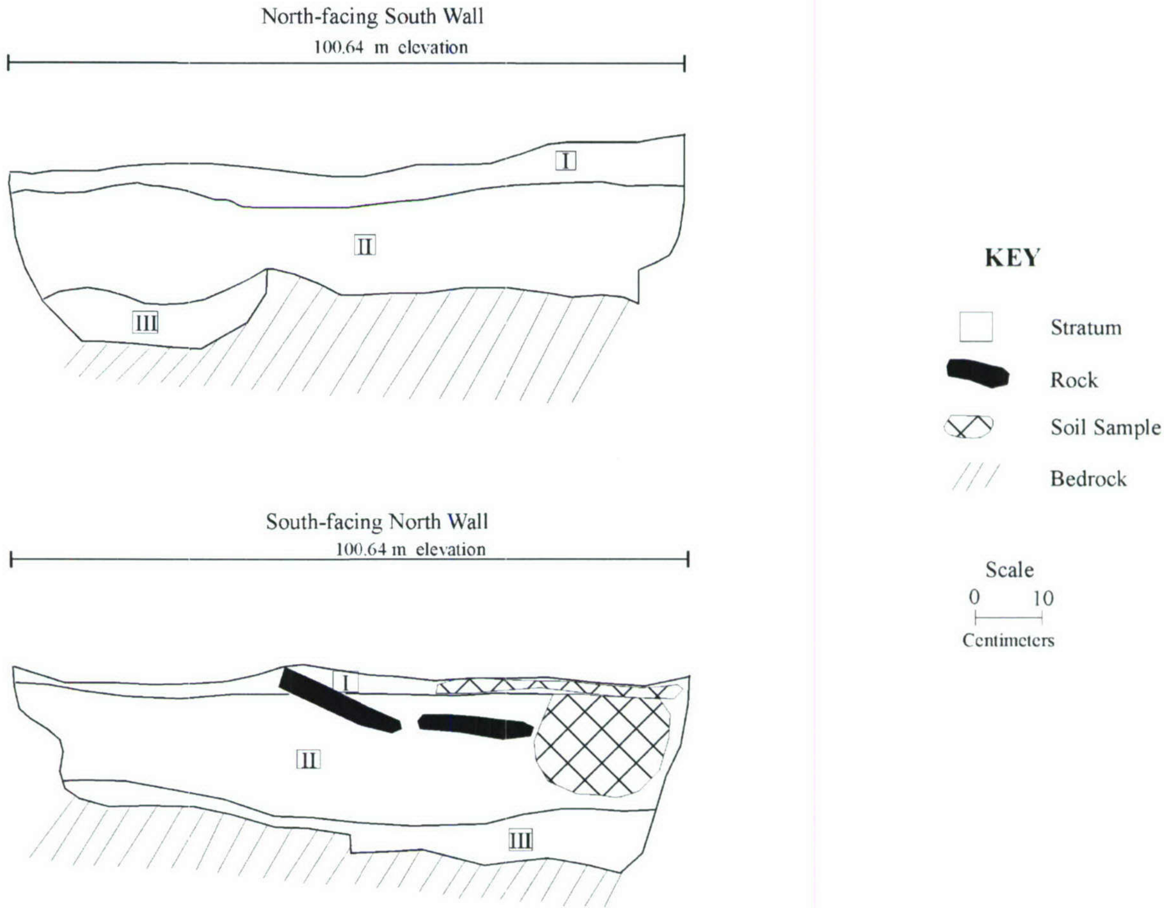


Figure 7.16. South wall profile and north wall profile, Test Unit 3, 5LA4417.

unit was excavated in two stratigraphic layers before bedrock was encountered at a depth of between 16 and 23 cm bgs. .

Layer 1 was a 3 cm thick overburden layer consisting mostly of grass and loose sediments. One flaked lithic artifact was recovered from the control sample of this layer (Table 7.4). A layer change was indicated by more compact sediments and dark mottling in the southwest and northwest corners of the test unit.

Layer 2 was excavated in two levels and ranged in thickness from between 13 and 20 cm. The mottling found in Layer 2 was eventually attributed to bioturbation. Decomposing bedrock and, finally, bedrock was reached and excavations were terminated. Flaked lithic artifacts and a charcoal sample were collected from Layer 2. A flaked tool was also removed from the west-facing east wall 12 cm below the ground surface during mapping of the wall profile.

Table 7.4. Test Unit 6 artifact summary, 5LA4417.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
6	Layer 1	*	3 cm	None	1 flaked lithic artifact, 1 macrobotanical sample
6	Layer 2	Level 1	7 - 10 cm	1 flake lithic artifact	2 flaked lithic artifacts, 1 charcoal sample
6	Layer 2	Level 2	6 - 10 cm	1 charcoal sample	1 charcoal sample
6	East Wall Profile			1 flake tool	None

* Excavated as a single stratigraphic layer

Two strata were identified in the south-facing north wall; three were identified in the west-facing east wall profile. These strata are shown in Figure 7.17 and they are described below.

Stratum I — Stratum I is a 5 to 10 cm thick brown (10YR 5/3), fine, single grained loam. The lower boundary is abrupt and smooth and the layer shows signs of bioturbation. An artifact was recovered from this stratum. Sediments have no reaction to hydrochloric acid.

Stratum II — Stratum II is composed of a fine brown (10YR 5/3) loam. The layer is 9 to 20 cm thick and ends at bedrock. The sediments are moderately well-developed and blocky. The matrix also consists of 15% poorly-sorted, angular pebbles and cobbles. Bioturbation continues from the above layer.

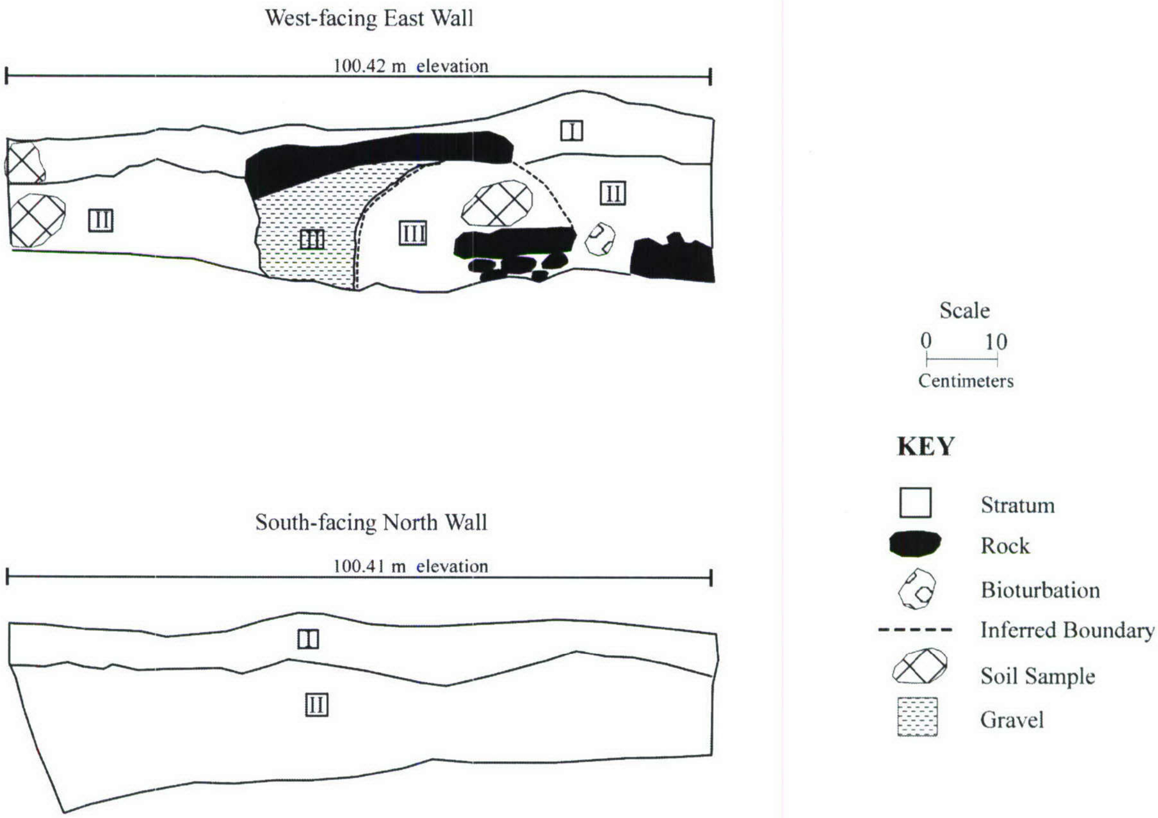


Figure 7.17. East wall profile and north wall profile, Test Unit 6, 5LA4417.

There is no calcium carbonate present. Cultural materials were recovered from Stratum II.

Stratum III — Stratum III is a 10 to 18 cm thick, very dark grayish brown (10YR 3/2) loam. The sediments are blocky and weakly developed. Sediments exhibit no reaction to hydrochloric acid. Bioturbation continues in this layer. Stratum III ends at bedrock. Charcoal and one flaked lithic tool, found in the profile wall, were collected from this stratum.

The shallow depth of this test unit, the minimal number of artifacts and the disturbance from rodent and root bioturbation make it difficult to discern any additional information regarding the function and temporal affiliation of Feature 6.

Test Unit 8

The final test unit completed at this site was placed over Feature 9, which was believed to be a hearth. The unit datum was placed at 78.28mN, 66.24mE, at an elevation of 1.87 mbsd for an arbitrary elevation of 98.13 m. The control unit was initially placed in the southwest corner but was moved to the southeast corner; then the northeast corner, because bedrock was encountered in both corners. The dark stained area observed at the ground surface was concentrated in the southwest portion of the test unit. Test Unit 8 was excavated in two layers to a final depth between 6 and 34 cm bgs.

Layer 1 was a 3 to 13 cm thick overburden layer composed of loose sediments with a high amount of gravels and plant materials. The unit also contained several flat sandstone slabs at the ground surface including one sandstone slab metate (Table 7.5). Sediments became more platy and changed colors indicating a layer change. Layer 2 ranged in thickness from 2 to 21 cm and was excavated in two levels. The darker staining in the southern portion of the unit remained evident in Layer 2; however, no features were identified or artifacts recovered before bedrock was reached.

Table 7.5. Test Unit 8 artifact summary, 5LA4417.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
8	Layer 1	*	3 - 13 cm	1 slab metate	None
8	Layer 2	Level 1	0 - 10 cm	None	None
8	Layer 2	Level 2	2 - 9 cm	None	None

* Excavated as a single stratigraphic layer

Four strata were identified in the west-facing east wall and the south-facing north wall profiles of Test Unit 8. Figure 7.18 illustrates the identified strata.

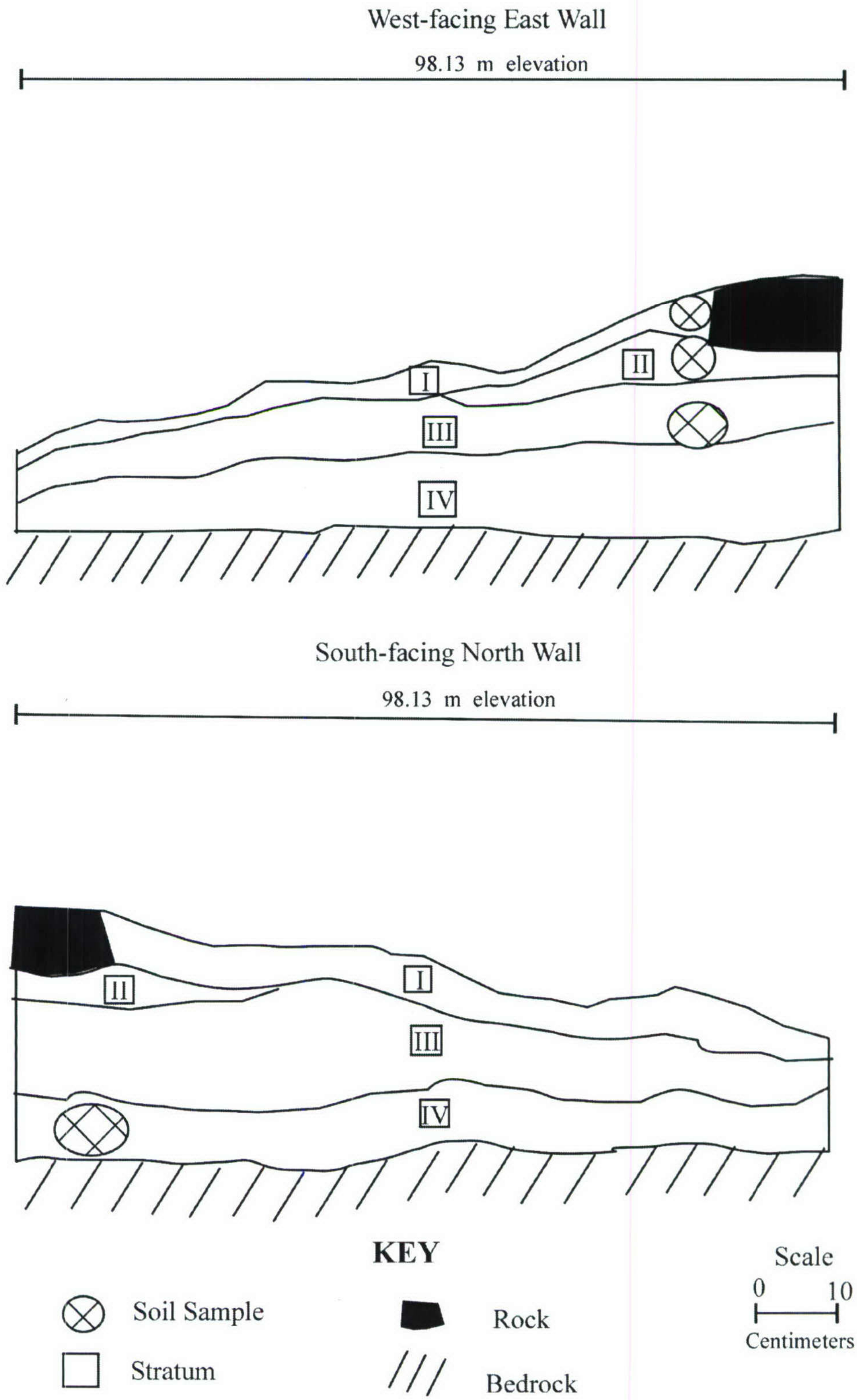


Figure 7.18. East wall profile and north wall profile, Test Unit 8, 5LA4417.

Stratum I — This stratum ranges in thickness from 1 to 7 cm. It is a light gray (5YR 7/1), single grained loam. The lower boundary is gradual and smooth. Sediments are composed of 1 to 3% poorly-sorted, angular gravels and show signs of bioturbation. No calcium carbonate is present. One artifact was found resting on the ground surface of Stratum I.

Stratum II — Stratum II is 1 to 6 cm thick. It is a gray (5YR 6/1) silt loam with a platy structure and a clear and smooth lower boundary. The sediments are composed of 15 to 25% well-sorted gravels and have a small amount of bioturbation. There is no reaction to hydrochloric acid. No cultural material was recovered from this stratum.

Stratum III — Stratum III is a 3 to 15 cm thick, dark gray (5YR 4/1) clay. Sediments are blocky to platy and have areas of light yellow staining. The matrix consists of 10 to 15% angular, poorly-sorted gravels. No calcium carbonate is present. No cultural material was recovered from this stratum.

Stratum IV — Stratum IV is 4 to 13 cm thick and is a very dark gray (5YR 3/1) clay loam. The sediments have a blocky structure; the lower boundary is gradual and smooth. The matrix is composed of 3 to 5% poorly-sorted, angular gravels. Bioturbation is present. A high amount of calcium carbonate present in this layer. No cultural material was recovered from the stratum

The only cultural material recovered from Test Unit 8 was a fragment of a slab metate found at the surface of the test unit. No other artifacts, ash, or charcoal were present to support the preliminary interpretation that the feature was a hearth.

Material Culture

Prehistoric Artifacts

The material culture collected from this site consists of four projectile point fragments, one drill, one bifacial tool, ten flaked lithic tools, 40 non-tool lithic flakes, and seven pieces of groundstone. In addition, eighty-eight lithic flakes, one core, and four pieces of groundstone were analyzed in the field.

Flaked Lithic Artifacts

Bifaces Three projectile points, one biface, and one drill were collected from the surface. One additional projectile point was recovered from Test Unit 1. None of these artifacts is complete. The surface artifacts are discussed first.

The first artifact discussed is a large, stemmed projectile point (5LA04417.000.148) made from a dull, gray brown chert. The blade is complete but the stem is incomplete (Figure 7.19). Based on the size of the artifact and the height of the

shoulder, it is likely that the specimen was part of a large side-notched projectile point. The artifact has a sharp tip, straight to slightly convex blade edges, and abrupt shoulders. In cross-section, the point is nearly plano-convex. One side of the blade has received more intense thinning than the other. Because the shape of the stem, tang, base could not be examined, it was not possible to determine temporal affiliation. All exposed edges of this specimen have been smoothed by either water or wind. No other artifact examined from this site exhibits this kind of wear. The amount of natural wear suggests that it has been exposed to the elements for some time.

Figure 7.19. Projectile point 5LA04417.000.148.

The second projectile point (5LA04417.000.147) is the blade of a small point made from gray, fossiliferous chert (Figure 7.20). The blade is snapped off at the hafting notch so the morphology of the stem is unknown. The blade is finely thinned with straight to slightly convex edges and a very sharp tip. The blade is bi-convex in cross-section. Although the temporal affiliation can not be determined the size of the artifact suggests that this fragment was from an arrow point.

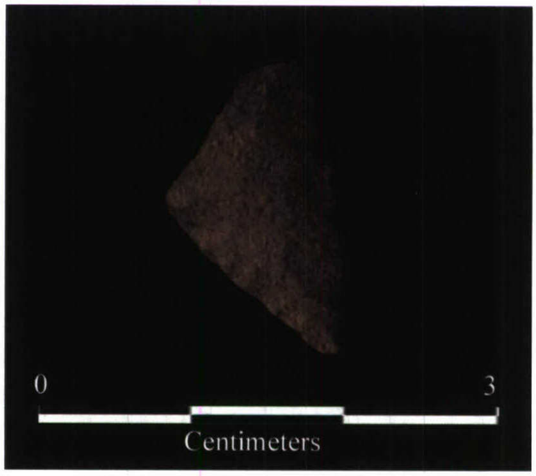


Figure 7.20. Projectile point 5LA04417.000.147.

The third projectile point (5LA04417.000.149) is small, thin, and unstemmed (Figure 7.21). This specimen is manufactured from red chert and has a lenticular or teardrop shape although the tip is missing. The point has slightly convex to straight blade edges, no shoulders or stem, a slightly convex base, and is bi-convex in cross-section. Other examples of this

Figure 7.21. Projectile point 5LA04417.000.149.

projectile point type have been identified at the PCMS. These examples include Loendorf et al. 1996:Figure 6.11d, Owens et al. 2000:Figure 5.12 and 13; Schiavitti et al. 2001:Figure 19B and Figure 131A; and Owens and Loendorf 2002:Figure 6.7. Category P49 from Anderson (1989:173) closely resemble this artifact. Based on comparisons made in Anderson (1989:175), this category dates to AD 800 to AD 1750. Although Anderson (1989) suggest that it may occur as early as 200 BC, it is also possible that this point type represents an unfinished point or preform.

The biface (5LA04417.000.155) is a large unfinished specimen. The artifact is nearly complete with one snap fracture along the margin. The specimen is manufactured from a pink, fine-grained quartzite. Based on the minimal amount of reduction and the overall thickness of the artifact, it is likely that this represents a biface in the early stage of manufacture.

Figure 7.22. Drill, 5LA04417.000.146.

The drill (5LA04417.000.146) is a large patterned biface made from gray, fine-grained quartzite with sand-like inclusions (Figure 7.22). This specimen has a long narrow blade that gently tapers toward the tip, which is missing. The proximal end has an expanding, bulb-like stem with convex edges and base. A flat area on the base may represent the remains of the original flake platform. There is evidence of attempted hafting where the blade expands into the stem. Single, slightly larger flakes were removed next to the stem on both sides to create a slight notch. In cross-section the drill is bi-convex with a slight counter clockwise twist. The drill has minimal observable use wear.

Only one formal lithic tool (5LA04417.000.150) was collected from the subsurface during testing. This reworked projectile point fragment was recovered from Test Unit 1, Layer 2, Level 2. This fragment represents the remains of a stemmed projectile point manufactured from red chert. The majority of the blade element, including the tip and both shoulders, are missing. This artifact has an expanding stem, a pointed tang, and a convex base. The blade is bi-convex in cross-section. One of the tangs was reworked to create a small perforator tool. There is evidence of unimarginal use wear adjacent to the modified tang. Because of the condition of the artifact, the temporal affiliation can not be determined but the size of the artifact suggests that this fragment was once part of a small dart point.

Flaked Lithic Tools A total of ten flaked lithic tools was collected from the site. The complete results of flake tool analysis are presented in Appendix VI. Five were collected during surface investigations and five were recovered from subsurface testing. Six flaked tools have no cortex while four retain less than 50% cortex. One of the tools is a spokeshave considered to be to be a patterned flake tool (Dean 1992). This tool is manufactured from red quartzite and was collected from the east wall profile of Test Unit 6. Two small flakes were removed to create a notch along its longest margin. Other than this small amount of unifacial retouch, this lithic tool shows no other retouch or use wear.

Nine unpatterned flake tools were also collected. These tools are considered to be simple tools and largely the product of the original flake shape rather than intentional modification. Of the five tools collected from the surface, three are manufactured from orthoquartzite. Two have unifacial retouch and no use wear and one exhibits no retouch but has bimarginal use wear. A fourth flake tool found from the surface is manufactured from gray quartzite with unimarginal and bimarginal use wear and no retouch. The fifth flake tool is a small obsidian flake with unimarginal retouch and bimarginal use wear.

In addition to the spokeshave, four other flake tools were recovered from subsurface testing. Three are manufactured from chert. One light brown chert flake with black inclusions was collected from the east wall of Test Unit 1, Layer 2, Level 2. This flake has bimarginal retouch and bimarginal use wear. A gray chert flake found in Test Unit 2, Layer 1, Level 1, shows evidence of both unimarginal and bimarginal retouch with unimarginal use wear. The third flake is manufactured from red and green chert. This flake, found in Test Unit 5, Layer 2, Level 1, has unimarginal retouch and unimarginal with bimarginal use wear. The final flake tool collected during excavation is a dark gray quartzite flake. Collected from Test Unit 5, Layer 2, Level 3, this tool exhibits evidence of both unimarginal and bimarginal retouch and use wear.

Non-tool Flaked Lithic Debitage Forty lithic flakes were collected during subsurface testing. Data from these lithic flakes are combined with data from the eighty-eight surface flakes analyzed in the field and are shown in Table 7.6. Lithic debitage is composed primarily of medium-sized (>¼ in to 1 in), simple flakes retaining no cortex. This points toward a predominance of early- to middle-stage lithic reduction occurring at this site. However, 20 flakes (15.6%) were either complex or bifacial thinning flakes suggesting that at least some later-stage lithic reduction was taking place at this site as well. Local raw materials, or those that required transport over only short distances, make up the bulk of the debitage assemblage with most of the flakes made of quartzite, chert/chalcedony, argillite, and hornfels/basalt. The two obsidian flakes indicate the transport of lithic material over substantial distances. In 1996 two samples of obsidian recovered from sites on the PCMS were submitted to Christopher Stevenson of Diffusion Laboratory, Archaeological Services Consultants, Columbus, Ohio, for hydration analysis (Charles et. al. 1996). One was sourced to Polvadera Peak in the Jemez Mountains of north central New Mexico; the other was sourced to Cerro del Medio in the

Table 7.6. Surface and subsurface non-tool lithic debitage, 5LA4417.

Material Type	Hornfels/Basalt				Dull Quartzite				Bright Orthoquartzite				Chert				Chalcedony				Argillite				Other				Total	
	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	No.	%
Size Grade																														
>1"	1	0	1		10	2	12		7	1	8		2	0	2		0	0	0		0	0	0		0	0	0		23	18
1/2"-1"	0	1	1		10	0	10		8	4	12		3	1	4		0	0	0		1	0	1		1	0	1		29	22.7
1/4"-1/2"	1	0	1		4	2	6		11	10	21		2	8	10		2	1	3		8	1	9		1	0	1		51	39.8
<1/4"	1	0	1		1	0	1		8	1	9		4	7	11		0	1	1		0	0	0		2	0	2		25	19.5
Total	**3**	**1**	**4**	**3.1**	**25**	**4**	**29**	**22.7**	**34**	**16**	**50**	**39.1**	**11**	**16**	**27**	**21.1**	**2**	**2**	**4**	**3.1**	**9**	**1**	**10**	**7.8**	**4**	**0**	**4**	**3.1**	**128**	**100**
Flake Type (Ahler 1997)																														
Shatter	2	0	2		2	1	3		2	3	5		3	4	7		0	0	0		1	0	1		0	0	0		18	14.1
Simple	1	0	1		17	1	18		29	11	40		8	9	17		1	1	2		8	1	9		3	0	3		90	70.3
Complex	0	0	0		6	1	7		3	2	5		0	0	0		1	1	2		0	0	0		1	0	1		15	11.7
Bifacial Thinning	0	1	1		0	1	1		0	0	0		0	3	3		0	0	0		0	0	0		0	0	0		5	3.9
Total	**3**	**1**	**4**	**3.1**	**25**	**4**	**29**	**22.7**	**34**	**16**	**50**	**39.1**	**11**	**16**	**27**	**21.1**	**2**	**2**	**4**	**3.1**	**9**	**1**	**10**	**7.8**	**4**	**0**	**4**	**3.1**	**128**	**100**
Cortex																														
Present	0	0	0		7	1	8		6	4	10		3	0	3		1	0	1		2	0	2		0	0	0		24	18.8
Absent	3	1	4		18	3	21		28	12	40		8	16	24		1	2	3		7	1	8		4	0	4		104	81.2
Total	**3**	**1**	**4**	**3.1**	**25**	**4**	**29**	**22.7**	**34**	**16**	**50**	**39.1**	**11**	**16**	**27**	**21.1**	**2**	**2**	**4**	**3.1**	**9**	**1**	**10**	**7.8**	**4**	**0**	**4**	**3.1**	**128**	**100**

S=Surface
SS=Subsurface
Other=Obsidian (2), Silicified Wood (1), Quartz (1)

in the same mountain range (Stevenson 1996). It is probable that the Jemez Mountains are the source for the obisidian found at this site and may have been procured through trade, travel to the source or collection from other sites.

Geofact

One geofact was collected from Test Unit 4, Layer 1, Level 2. The specimen is a white, water-worn quartz pea gravel with dark gray mottling. The fragment appears to be about 50% complete. Although this gravel was polished and smoothed by natural forces, it appeared out of place in this setting and was collected by the excavators.

Groundstone

Seven groundstone artifacts were collected from the site. Four were collected during the surface survey. Two other specimens were collected from at or very near the surface. Only one groundstone artifact, a metate fragment collected from Layer 2, Level 1 of Test Unit 1, was collected from subsurface deposits. Three manos and one slab metate fragment were collected from the surface. All three manos are complete sandstone cobbles with one grinding surface. The smooth grinding surfaces of all three display light to moderate use while two have evidence of battering or some use as a hammerstone on their ends. One mano is highly polished rather than ground and may have been used on softer materials rather than as a grinding stone. Three of the collected groundstone are fragments of sandstone slab metates. Two fragments show evidence of only very slight use while the largest specimen displays signs of both moderate grinding and a high percentage of pecking. The final groundstone artifact is a small piece of sandstone with a very smooth surface on one side. It is possible that this piece spalled off a larger groundstone slab, or it may represent a lapstone or some other type of groundstone artifact.

In addition to the artifacts collected, four non-portable groundstone artifacts were analyzed in the field. Two are flat, unshaped block sandstone metates, each with moderate smoothing on one surface. One is a complete specimen that measures 40 cm x 21 cm x 12 cm and has a circular 15 cm x 15 cm grinding surface with no evidence of polishing or pecking. The other is believed to be more than 50% complete and has a rectangular grinding surface measuring 23 cm x 15 cm. Polishing and pecking are absent on this specimen as well. Two sandstone slab metates were also analyzed in the field; one specimen is less than 50% complete while the other is more than 50% complete. The grinding surfaces are circular to oval and range in length from 15 to 17 cm and in width from 13 to 15 cm. Neither has evidence of striations, polishing or pecking.

Faunal Material

A total of 240 bulk bone specimens was analyzed from this site. All of the faunal material collected came from Test Unit 2 (Feature 1) and Test Unit 4 (the midden) and Test Units 1 (Feature 5), 5 (Room 1) and 7 (Room 2). The complete analysis of faunal remains from the site is provided in Appendix I. Only 43 bones, or 17.9% of the total assemblage, are identifiable in some manner. The majority of the faunal material identified represents the remains of unidentifiable small mammals or rodents. Single

specimens from a cottontail rabbit and a pocket gopher bone represent the only bones identifiable to species. A small percentage of bone was also attributed to small- to medium-sized mammals.

A total of 61 bulk bone was analyzed from Feature 1. Only one specimen, an unidentifiable fragment from a medium to large mammal, showed evidence that might be attributed to human modification; however, that evidence is not conclusive. A high percentage (62.3%) of the faunal materials collected from the test units excavated in Feature 1 is burned. The high percentage of burned remains adds credence to its original function as a midden or roasting pit.

Feature 5, Room 2, had the highest concentration of bone with 164 individual pieces. A total of 179 bone was analyzed from Feature 5, Rooms 1 and 2. Both a cottontail (*Sylvilagus sp.*) metapoidal bone and a left and right humerus from a pocket gopher (*Geomyidae sp.*) were found in Feature 5, Room 2. Twenty-eight or 15.6% of the analyzed bones from Feature 5 exhibit some signs of burning. Only one bone displays evidence of modification that can be conclusively determined to be the result of human action. This specimen is a half of a tubular bone bead recovered from Feature 5, Room 2 (Test Unit 5, Layer 2, Level 3). The bead (5LA04417.000.249) is manufactured from a small mammal tibia-fibula possibly from a cottontail (Figure 7.23). Both ends of the bone tube show signs of being subjected to annular scoring until the ends were broken off cleanly to form a bead 13 mm in length.

Figure 7.23. Bone bead 5LA04417.000.249.

Conclusions

Site 5LA4417 is comprised of prehistoric and historic features and artifacts. The historic component is limited to a line of sandstone boulders and juniper posts likely delineating a historic telephone line. A glass insulator has a manufacturing date between 1914 and the 1950s. It is suspected, however, that the line probably dates to the 1940s at the earliest.

Excavations yielded relatively few artifacts; however, the variety of artifacts found at this site may indicate activities such as hunting, lithic reduction, and food processing. Prehistoric architectural features suggest at least some short-term seasonal habitation. Overall, sediments are shallow in all of the tested areas and bedrock is exposed over much of the site. The high percentage of burned bone and fire-cracked rock in Feature 1 may indicate that its original function was a midden or roasting pit. Two charcoal samples yielded 2 sigma calibrated calendar dates of AD 1020 - AD 1220 and AD 990 - AD 1230. During the original assessment the site was dated to AD 200 - 1400 based on the presence of six projectile points fragments. An additional point, collected by FLC in 2003, suggests a occupation date ranging from AD 800 - AD 1750 but possibly as

early as 200 BC. These dates place the site primarily in the Late Prehistoric stage (Zier and Kalasz 1999).

Management Recommendation

The dearth of substantial subsurface deposits indicates a lack of potential for integrity and/or additional significant research potential. The level of testing conducted at this site is believed to be sufficient to determine that the site does not hold the potential to yield additional information significant to prehistory. Based on these observations, this site is recommended as ineligible for inclusion in the NRHP and no further work is recommended.

CHAPTER 8
SITE 5LA5612

Introduction

This large site covers 11,511 square meters or 2.84 acres in an area of gently rolling terrain and intermittent drainages. It is at an elevation of 1539 m (5050 ft) above sea level (asl). An escarpment extends in a generally southwest/northeast direction parallel to a small tributary arroyo of Rockwood Arroyo (Rock Crossing 7.5' United States Geological Survey quadrangle [Figure 8.1 location map]). Above the escarpment the landscape consists primarily of sandstone bedrock outcrops with shallow soil deposition. In the tributary there are a few natural water catchment features that are known to have collected water in the past. Sagebrush, snakeweed, juniper, cacti, and grasses are the predominant vegetation at this site. A grassland setting with scattered trees is visible in all directions from the escarpment (Figure 8.2).

In 1983, during the original assessment of the site by Denver University (DU), the site was identified as a predominately prehistoric site. Cultural materials and features were identified next to the arroyo, particularly along its eastern edge, and on the sandstone escarpment above the drainage. A sparse lithic scatter on top of the bedrock, a more dense scatter at the northwestern edge of the drainage and four bedrock grinding areas (Features 2 - 5) were identified. A 62-meter-long area in the drainage along the base of the rock escarpment was designated Feature 7 and included a rock shelter, several hearths, rock piles, and a natural water catchment feature. At least 12 possible hearths were mentioned along the bedrock outcrop. A 97-meter-long alignment of piled rocks was interpreted as being an historic fence line (Feature 1). At this time erosion was considered a significant threat to the integrity of the site. Despite the erosional issues, the site was considered to have the potential to provide further archeological information.

When the site was originally recorded 30 artifacts were collected. The initial collection strategy employed at the site is unclear but it appears that all tools were collected as were artifacts from two, 2-meter-wide dog leash samples. The recovered artifacts include a projectile point base, an endscraper, a sandstone mano, a black pebble fragment, a unidirectional core, a biface, four additional flaked lithic tools, and twenty lithic flakes. The flake tools were manufactured from chert, argillite, and quartzite. The flakes were made from chert, quartzite, basalt, and argillite. The collected projectile point base (5LA5612.16) is reported in Lintz and Anderson's (1989) study of temporally diagnostic material at the PCMS. Based on the comparisons made in Anderson (1989:167) with other points outside the PCMS, this point was placed in a broad time span from 3000 BC to 300 BC.

During the 2001 field season David Kuehn Consulting and New Mexico State University (NMSU) conducted test excavations at this site. One of the primary goals of these excavations was to examine the impact of tracked vehicular disturbance on potential cultural deposits at the site.

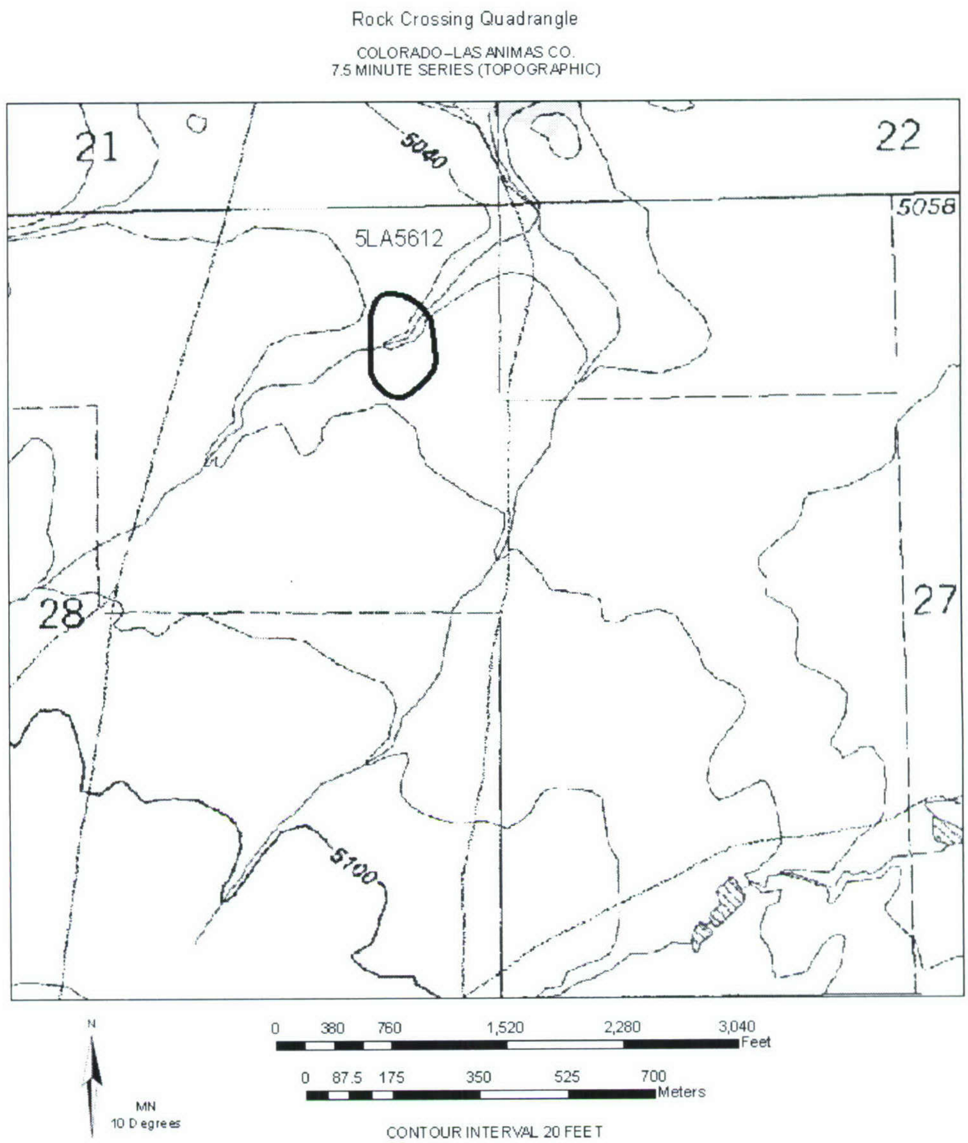


Figure 8.1. Locational map, 5LA5612, PCMS..

Figure 8.2. Site overview, 5LA5612. View is to the northeast.

In 2003 FLC received a site map from David Kuehn (David Kuehn, personal communication 2003) which indicates that 31 1 m x 1 m test units were placed within vehicular disturbances at the site. Five bedrock metates, two hearths, two groundstone fragments, a scraper, a projectile point tip and Feature 7 were also identified on this map. No information on the results of this testing program was available at the time of this report, although a draft report is in preparation.

Surface Investigation

The 2003 investigations by FLC began with a systematic pedestrian survey intended to locate the original site datum, the main artifact concentrations, and the features identified by DU. Initial work at this site also included the completion of a topographical map, which included the site's boundaries (reduced from 9.49 acres to 2.84 acres), all surface cultural

features, the distribution of surface artifacts, excavation units, and shovel tests (Figure 8.3). Because the original site datum could not be relocated a new main datum, marked with rebar, was placed at the site. To allow for Total Station mapping of this large site, the main datum was designated as 1000mN, 1000mE, at an elevation of 100 m. Two temporary subdatums were used to facilitate site mapping. Additional mapping consisted of tank tracks, the road, the drainage, and test units from previous excavations.

Features

Seven features were previously identified by DU. Using Xerox copies of the original site maps, FLC expended a considerable amount of time trying to relocate these features. Some were successfully relocated; others were not.

<u>Feature 1</u>

This feature was originally recorded as a 97-meter-long alignment of piled rocks, spaced 5 to 10 meters apart, running from the drainage across the bedrock. Fourteen rockpiles were identified occurring twice in pairs and once with three piles together. This feature was interpreted as a historic fenceline associated with historic structures that occur to the northwest of this site. This feature was not relocated in 2003.

<u>Features 2-5</u>

The most prolific artifacts/features at this site are bedrock metates. Four were identified during the original site evaluation and sixteen (Features BM 1 - 16) were recorded during the 2003 field session. Although there was some difficulty in matching the four bedrock metates recorded by DU to those identified in 2003, it is believed that these sixteen include the four originally recorded.

<u>Feature 6</u>

No feature was identified as Feature 6 on the original site form or on the map. Therefore, information about where this feature, was or where it should have been located was unavailable.

<u>Feature 7</u>

Feature 7 consisted of a 62-meter-long area along the drainage that included a small rock shelter, several hearths, rock piles, and a natural water catchment. The rock shelter and the water catchment were relocated but no hearths or rock piles were observed.

The hearths, historic fence line, and associated rock piles were not relocated during the 2003 surface investigations. In addition to the sixteen bedrock metates identified and mapped by FLC, 102 flaked lithic artifacts, and five lithic cores were mapped but were not collected. One flaked tool fragment, one projectile point, one portable groundstone fragment, and one manuport comprised the surface collection. A small panel of historic graffiti measuring 16 cm x 6 cm was discovered on the sandstone escarpment behind a large juniper tree in the arroyo. The name 'DURAN" with the "N" spelled backward was incised into the rock face about 15 cm above the present ground surface. Some deterioration, the

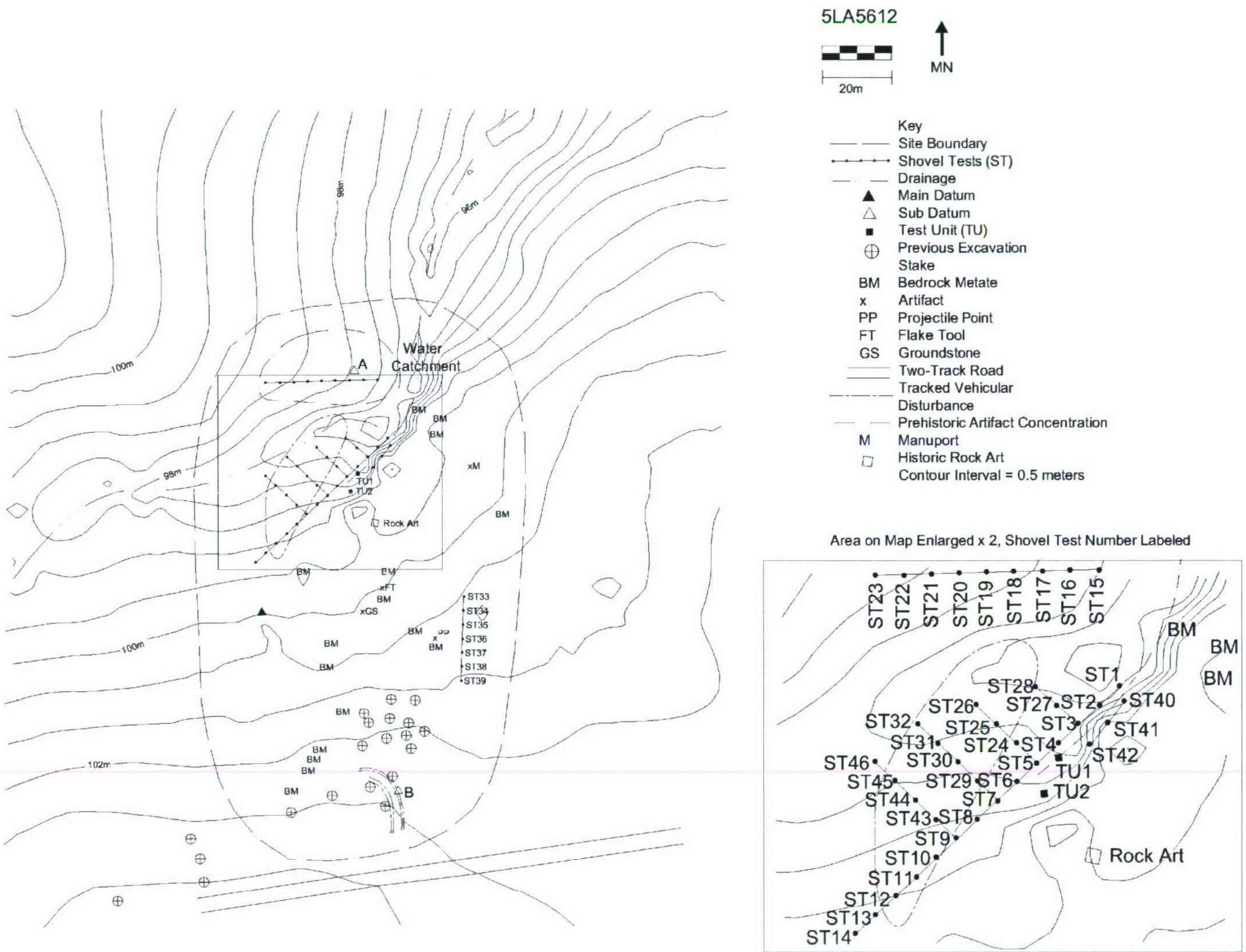


Figure 8.3. Site map, 5LA5612.

result of natural exposure, is evident on the panel.

Subsurface Testing

Subsurface testing conducted by FLC included 46 shovel test pits (STP) placed next to the arroyo as well as in an area above the escarpment where sediments have accumulated between the bedrock outcroppings and where surface artifacts were exposed. Two 1 m x 1 m test units were excavated near the rock shelter to test for the previously described hearths.

Shovel Tests

Of the 46 STPs completed at this site 39 (STP 1 - 32 and 40 - 46) were placed near the arroyo where sediments were deep and cultural deposits were previously identified (Figure 8.3). One line of seven STPs (STP 33 - 39) was completed in the shallow sediments of the bedrock area above the escarpment where a light concentration of lithic material and 16 bedrock metates were recorded. (See Appendix V for compete shovel test information).

The first line of STPs (STP 1 - 14) was placed along the drainage where Feature 7 was originally identified. This area had deep sediments extending beyond 70 cm. None of these STPs produced cultural materials (Table 8.1). A second line of nine STPs (STP 15 - 23) was set in across the drainage to the north where a large (40 m x 20 m) lithic concentration was located. Three STPs (18, 19, and 22) produced lithic flakes between 0 to 20 cm below the surface, but no cultural materials were recovered deeper than 20 cm. Four additional shovel test lines were set in perpendicular to the line of STP 1 - 14. They were extended to the northwest of STP 3, STP 5, STP 7, and STP 9. Of these, STP 32 yielded one lithic flake. In addition one lithic flake each was recovered from STP 24, STP 26, and STP 45. Three lithic flakes were collected from STP 29. One bulk bone was found in STP 26. Five bones were collected from STP 29 and two bulk bones were collected from STP 44.

Three more STPs (STP 40 - 42) were placed under the overhang along Feature 7. Charcoal was recovered from STP 40. One bone each was collected from STP 40, STP 41, and STP 42. These test pits reached depths ranging from 20 cm to 75 cm. One last line (STP 33 - 39) was placed near where a projectile point was found on the bedrock outcrop on the southern portion of the site. Excavations revealed sediments ranging from 9 cm to 46 cm but only one lithic flake was recovered from these seven shovel test pits. This single lithic flake was recovered from STP 33. A charcoal sample was also collected at a shallow depth from STP 33.

Test Units

Two 1 m x 1 m test units were placed in the area of Feature 7 next to the escarpment where DU identified a small rockshelter and several hearths (Figure 8.3). Test Unit 1 was placed under a sandstone overhang that was recorded as having a possible smoke blackened wall. Test Unit 2 was located under a juniper tree where two hearth features were previously identified and near the small historic rock art panel discovered by FLC.

Table 8.1. Shovel test summary, 5LA5612.

Shovel Test Number	Quantity	Artifact/Material Type	Depth Below Ground Surface (cm)
1 - 17	--	0	0
18	1	lithic flake	0 - 20
19	2	lithic flake	0 - 10
20 - 21	--	0	0
22	1	lithic flake	0 - 10
23	--	0	0
24	1	lithic flake	40 - 50
25	--	0	0
26	1	bulk bone	40 - 50
	1	lithic flake	40 - 50
27 - 28	--	0	0
29	3	lithic flake	40 - 50
	5	bulk bone	50 - 60
30 - 31	--	0	0
32	1	lithic flake	0 - 10
33	1	lithic flake	10 - 20
	1	charcoal sample	0 - 10
34 - 39	--	0	0
40	1	bulk bone	20 - 30
	1	charcoal sample	50 - 60
41	1	bulk bone	20 - 25
42	1	bulk bone	0 - 10
43	--	0	0
44	2	bulk bone	0 - 10
45	1	lithic flake	40 - 50
46	--	0	0

Test Unit 1

The Test Unit 1 datum was placed at 1040.63mN, 1027.29mE, at an elevation of 2.09 mbgs or an arbitrary elevation of 97.91 m. The datum was placed away from the unit and much higher in elevation than the profiles. Test Unit 1 was excavated in three layers to a final depth of between 32 and 52 cm below ground surface. Layer 1 was an overburden layer that consisted of a large amount of organic material from a nearby juniper tree. Layer 1 was excavated as a single stratigraphic layer which ranged from 4 to 5 cm thick. The dark gray, fine grained sediments had a high percentage of gravels and cobbles. Bioturbation was present. A lithic core, charcoal, and bulk bone were recovered from this layer, predominantly

from the control sample (Table 8.2). A layer change was indicated as the sediments became more compact.

Table 8.2. Test Unit 1 artifact summary, 5LA5612.

Test Unit	Layer	Level	Thickness Range	Materials Recovered	
				1/4"	1/16" Control
1	Layer 1	*	4 - 5 cm	4 bulk bone, 1 core	28 bulk bone, 1 charcoal sample, 1 macrobotanical sample, 1 gastropod sample
1	Layer 2	Level 1	0 - 10 cm	None	43 bulk bone, 1 charcoal sample, 1 macrobotanical sample, 1 gastropod sample
1	Layer 2	Level 2	0 - 9 cm	None	37 bulk bone, 1 gastropod sample
1	Layer 2	Level 3	0 - 11 cm	1 charcoal sample	91 bulk bone, 1 flaked lithic artifact, 1 charcoal sample, 1 gastropod sample, 1 macrobotanical sample
1	Layer 3	Level 1	9 - 10 cm	1 bulk bone, 1 brown glass fragment, 1 charcoal sample	24 bulk bone, 1 charcoal sample, 1 gastropod sample
1	Layer 3	Level 2	9 cm	1 bulk bone, 1 charcoal sample	34 bulk bone, 1 charcoal sample, 1 gastropod sample
1	Layer 3	Level 3	0 - 10 cm	1 charcoal sample	20 bulk bone, 1 charcoal sample, 1 gastropod sample

*Excavated as a single stratigraphic unit

Layer 2 was excavated in three levels reaching a thickness of between 0 and 30 cm. Sediments remained dark and continued to contain gravel and roots. Bioturbation continued from the layer above. Bulk bone, charcoal, and a flaked lithic artifact were collected. Similar to Layer 1, these materials were recovered primarily from the processed control sample rather than from the ¼ in screen. A change to a third layer was indicated as sediments became reddish brown and sandier.

Layer 3 was also excavated in three levels and ranged in thickness from between 18 and 29 cm. This layer contained a high percentage of angular sandstone cobbles, roots, and bioturbation. One piece of brown glass was found in Layer 3, Level 1. Because of the slope a portion of the unit was still very close to the original ground surface and this may explain the presence of glass in this level. Charcoal samples and bulk bone were also recovered from Layer 3. These materials were recovered primarily from the control sample. Excavation of Test Unit 1 was terminated after the excavation of two culturally sterile levels and when a large boulder protruded into the unit indicating that bedrock was near.

The charcoal samples collected from the 1/4 in screen and from the control samples were combined for Layer 3, Level 2 and for Layer 3, Level 3. Both were submitted for AMS radiocarbon dating (Appendix III). The first sample (5LA05612.017.048), collected from

Layer 3, Level 2, delivered a conventional radiocarbon age of 1170 +/- 40 BP (Beta 192261). The calendar corrected 2 sigma date range is AD 770 to AD 980, and the intercept of radiocarbon age with calibration curve is AD 880. The conventional radiocarbon age of the second sample (5LA05612.017.047), recovered from Layer 3, Level 3, is 2480 +/- 40 BP (Beta 192262). The calendar corrected 2 sigma date of this sample is 790 BC to 410 BC. The intercepts of radiocarbon age with the calibration curve are 760 BC, 680 BC, and 550 BC (average 663 BC).

Four gastropod samples from Test Unit 1 were sent for analysis. Sample 5LA05612.017.049, recovered from Layer 2, Level 3, contained Rocky Mountain Dagger, White Lip Dagger, and *Oxyloma* snails. Sample 5LA05612.017.050 was recovered from Layer 3, Level 1 and yielded Multirib Vallonia and Rocky Mountain Dagger snails. Sample 5LA05612.017.054 (Layer 3, Level 3) contained Multirib Vallonia, Rocky Mountain Dagger, and *Oxyloma*. See Appendix II for the complete results of this analysis.

Three strata were identified in the south-facing north wall profile; four were identified in the north-facing south wall (Figure 8.4). These strata are described below.

Stratum I — Stratum I is a 5 to 13 cm thick layer of brown (10YR 5/3), sandy clay loam. The soil structure is single grained and contains a large amount of organic material. The lower boundary is smooth to wavy. Gravels are angular and poorly sorted and comprise 3 to 5% of the matrix. Sediments react violently to hydrochloric acid. This stratum exhibits a high amount of bioturbation. Cultural materials were recovered from this stratum.

Stratum II — Stratum II is a 1 to 46 cm thick layer of grayish brown (10YR 5/2), sandy clay with a single grained structure. The lower boundary is smooth to wavy. Poorly sorted pebble- to boulder-sized gravels increase to between 15 and 20%. The sediments react violently to hydrochloric acid. Bioturbation from roots and rodent burrowing continues from Stratum I. Cultural materials were recovered from the transition between Stratum II and Stratum III.

Stratum III — Stratum III is 1 to 35 cm thick and is a brown (10YR 5/3), sandy clay. It is single grained in structure and the stratum's lower boundary is smooth to wavy. Pebble- to boulder-sized, poorly sorted rocks make up 15 to 20% of the matrix. The sediments again react violently to hydrochloric acid which indicates a high amount of calcium carbonate. Cultural materials were collected from Stratum III.

Stratum IV — Stratum IV, where exposed, is a sandy clay loam ranging from 1 to 10 cm in thickness. The sediments are reddish brown (10YR 5/3) and have a blocky structure. The lower boundary remains concealed. Calcium carbonate increases somewhat as indicated by a very violent reaction to hydrochloric acid. Angular and poorly sorted gravels decrease to 0 to 3% of the matrix. A small amount of charcoal was collected from this stratum.

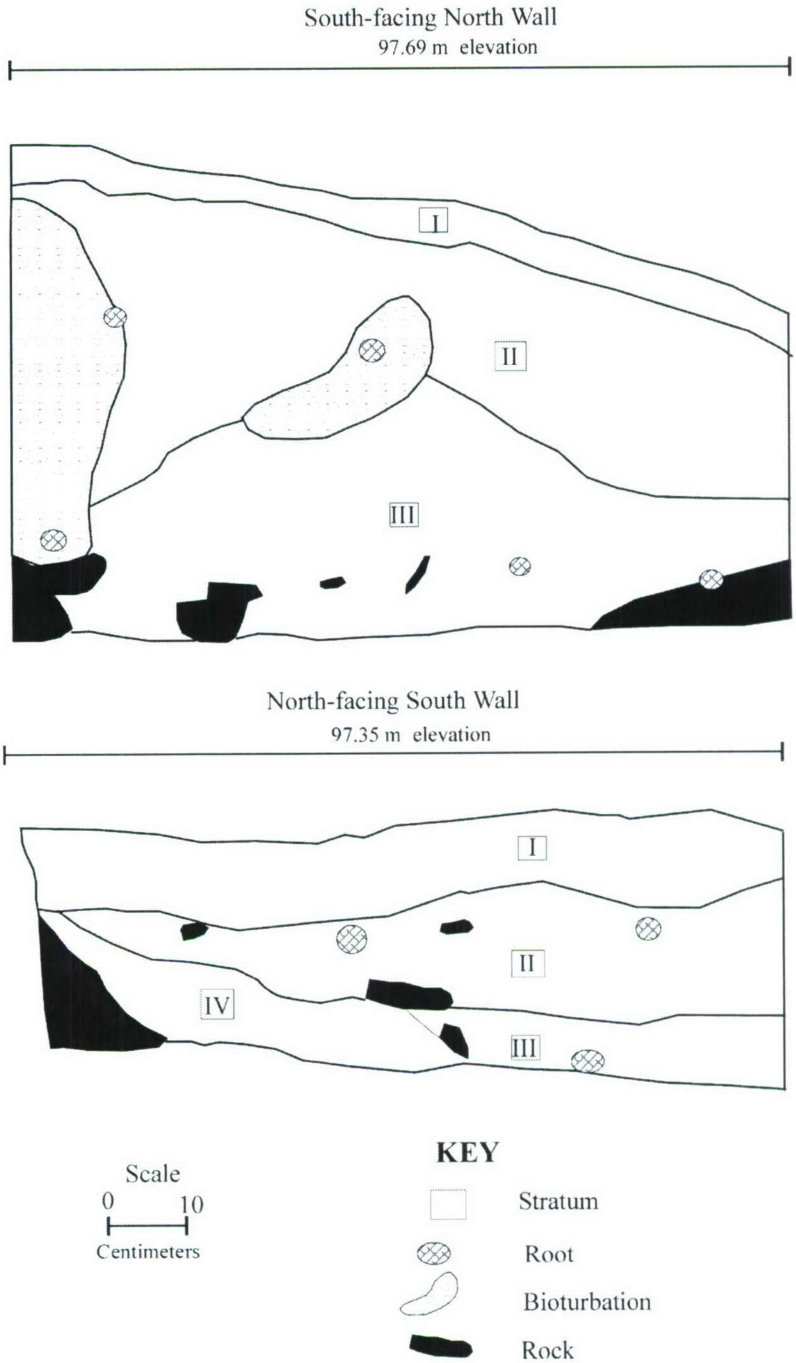


Figure 8.4. North wall profile and south wall profile, Test Unit 1, 5LA5612.

Three artifacts were recovered from Test Unit 1. The artifacts include: a core, found on the surface; one flake, recovered from the transition from Stratum II to Stratum III; and one piece of glass collected from Stratum III. Bioturbation has had an obvious impact on the integrity of cultural deposits within Test Unit 1. The historic glass occurs at roughly the same depth as lithic artifacts because of the slope. The high number of small rodent bones recovered, particularly from the 1/16 in screen, is an indication of the severity of bioturbation in the test unit. Several charcoal samples were recovered during the excavation of Test Unit 1, but no evidence of hearths or intact occupational surfaces was revealed. The radiocarbon dates for the two samples sent for analysis are separated by over 1000 years and neither was directly associated with a feature or with any of the recovered artifacts.

Test Unit 2

Test Unit 2 was placed in the area where two possible hearths (Feature 7A) were identified in 1983. The unit datum was placed at 1034.25mN, 1024.72mE, at an elevation of 1.74 mbsd for an arbitrary elevation of 98.26 m. The unit was excavated in three layers to a final depth of between 40 to 62 cm bgs. Layer 1 was excavated as a single stratigraphic layer ranging from 2 to 12 cm in thickness and was composed primarily of seeds, branches, and other organic material from the juniper whose roots were wrapped around the unit. The remaining matrix was fine-grained and poorly consolidated. No artifacts were collected from the 1/4 in screen; however, bulk bone and a charcoal sample were recovered from the layer's control sample (Table 8.3).

Table 8.3. Test Unit 2 artifact summary, 5LA5612.

Test Unit	Layer	Level	Thickness Range	Materials Recovered	
				1/4"	1/16" Control
Unit 2	Layer 1	*	2 - 12 cm	None	57 bulk bone, 1 macrobotanical sample, 1 gastropod sample
Unit 2	Layer 2	Level 1	1 - 10 cm	1 flaked lithic artifact, 5 bulk bone	None
Unit 2	Layer 2	Level 2	3 - 10 cm	16 bulk bone	90 bulk bone, 1 flaked lithic artifact,1 charcoal sample, 1 gastropod sample, 1 macrobotanical sample
Unit 2	Layer 2	Level 3	10 cm	1flaked lithic artifact, 1 bulk bone	36 bulk bone, 1 charcoal sample, 1 gastropod sample, 1 macrobotanical sample
Unit 2	Layer 3	Level 1	10 cm	2 bulk bone	46 bulk bone, 1 gastropod sample, 1 macrobotanical sample
Unit 2	Layer 3	Level 2	10 cm	None	None

*Excavated as a single stratigraphic layer

Layer 2 was excavated in three levels reaching a thickness of between 17 and 30 cm. The sediments were grayish brown with a low occurrence of gravels but a high percentage of bioturbation, mainly from roots. Flaked lithic artifacts, bulk bone, and charcoal samples were collected from Layer 2. The bulk bone was recovered primarily from the control samples. A layer change was indicated as the sediments became lighter in color.

Layer 3 consisted of two 10 cm levels of moist, light grayish brown sediments. Bulk bone was collected for Layer 3. These also came predominantly from the control samples. The excavation of Test Unit 2 was terminated after two culturally sterile 10 cm levels were excavated.

One gastropod sample, recovered from Test Unit 2, Layer 2, Level 2 (5LA05612.017.053) was sent for analysis. This sample contained Multirib Vallonia and Rocky Mountain Dagger gastropods. See appendix II for the complete results of this analysis.

Four strata were identified in the profile of the north-facing south wall and the west-facing east wall. These are described below (Figure 8.5).

Stratum I	Since this layer consists of organic overburden no Munsell color, sediment structure or texture were determined. The stratum is 2 to 4 cm thick and has an abrupt and smooth lower boundary. There is a high occurrence of bioturbation from roots, insects, and rodents. Calcium carbonate is not present in the matrix. Bulk bone was recovered from the stratum.
Stratum II	Stratum II is a 3 to 6 cm thick, very dark grayish brown (10YR 3/2), sandy loam with a platy to subangular and blocky structure. The lower boundary is smooth. Sediments exhibit a moderate reaction to hydrochloric acid. Poorly sorted, angular sandstone pebbles make up 2% of the matrix. Like Stratum I this stratum is also heavily bioturbated. Cultural materials were collected from Stratum II and/or the transition from Stratum II to Stratum III.
Stratum III	Stratum III is dark grayish brown (10YR 4/2), clay loam that ranges in thickness from 4 to 10 cm. The soil is single grained to angular and moderately well-developed. The stratum has a smooth lower boundary. Poorly sorted, angular sandstone pebbles and cobbles account for 2% of the sediments. Heavy bioturbation continues from the upper layers but calcium carbonate decreases. Cultural materials were collected from Stratum III and the transition from Stratum III to Stratum IV.
Stratum IV	Where exposed, Stratum IV is a 15 to 39 cm thick layer of grayish brown (10YR 5/2) silt loam. The sediments are subangular and blocky and react moderately to hydrochloric acid. Two percent of the matrix is composed of poorly sorted angular sandstone pebbles, cobbles, and boulders. The lower boundary remains concealed.

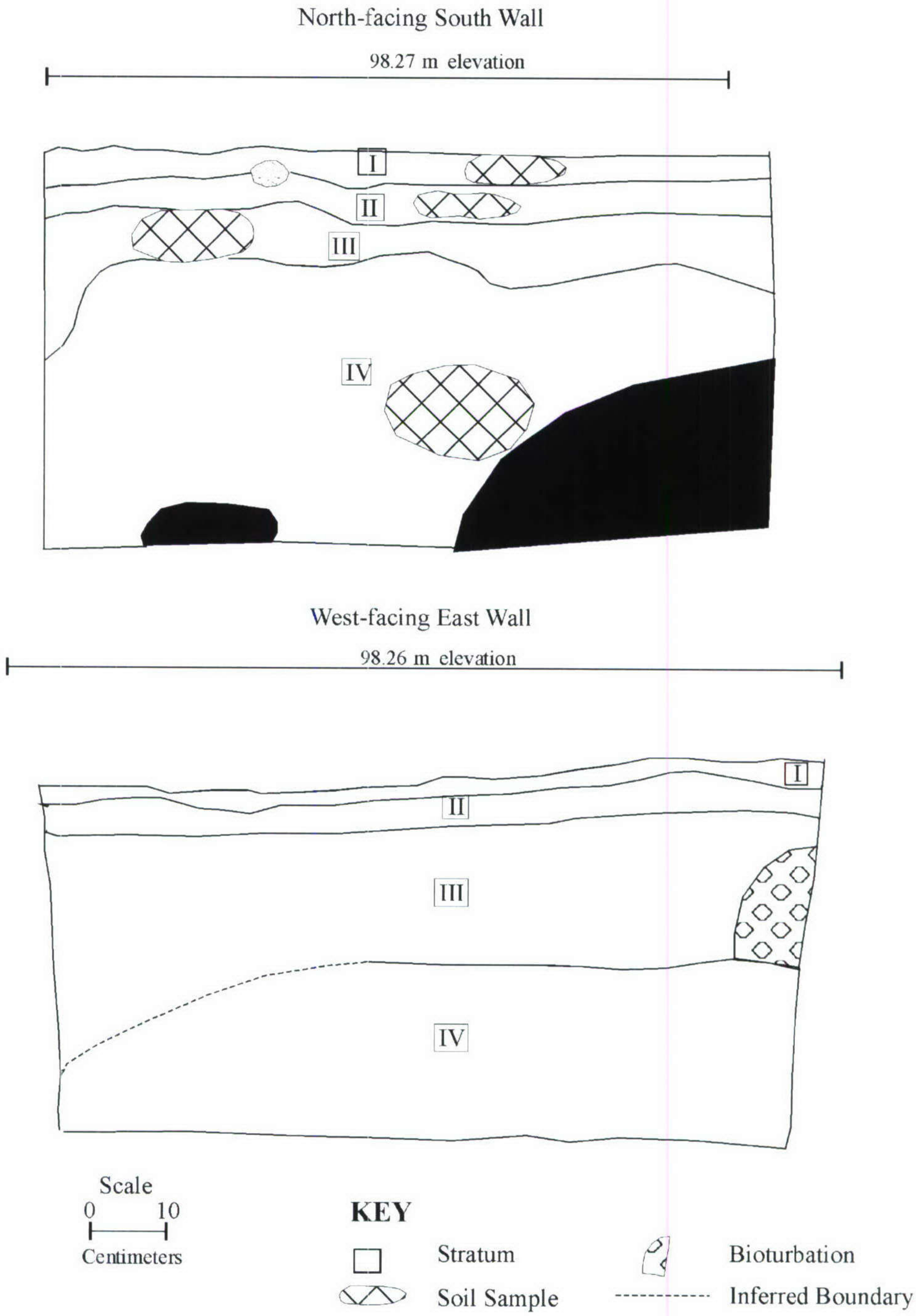


Figure 8.5. South wall profile and east wall profile, Test Unit 2, 5LA5612.

Three flaked lithic artifacts were recovered from Test Unit 2. The flakes were found at different depths. The final two levels of Test Unit 2 were culturally sterile. Again, a high number of small-sized bone were recovered, particularly from the control samples. The presence of these small rodent bones coincides with the amount of bioturbation encountered during the excavation of Test Unit 2. Together these indicate that the integrity of cultural deposits has been compromised. No evidence of hearths or intact occupational surfaces was uncovered by the excavation of Test Unit 2.

Material Culture

Prehistoric Artifacts

One projectile point, one flaked tool fragment, one portable groundstone fragment, and one manuport were collected during surface investigations. Sixteen bedrock metates, one-hundred and two lithic flakes, and five lithic cores were mapped and analyzed in the field. An additional sixteen lithic flakes were collected from subsurface testing. Both surface and subsurface artifacts are included in the discussion of material culture found at the site.

Flaked Lithic Artifacts

Bifaces The projectile point fragment (5LA05612.017.001) found on the surface was collected from the site. This projectile point is a small, expanding stemmed specimen manufactured from purple chert (Figure 8.6). The blade is triangular and is missing the very tip. One blade edge is straight while the other is slightly convex. One side of the blade has been intensively thinned while the other side has only edge modification. The notching on one side is deep enough to create a barbed shoulder. The stem on this side has enough remaining to reveal that the stem is expanding and the tang is pointed. The notch on the other side is not as deep. In a probable attempt at symmetry, it appears that during deepening of the notch the bottom of the point base snapped off. The point is bi-convex in cross-section. The missing portion of the base makes temporal comparisons difficult; however, Category P62 specimens from Anderson (1989:193) best resemble this artifact. Two radiocarbon dates from two sites (5LA5305 and 5LA5402) at the PCMS associated with deposits containing Category P62 points provide dates from AD 1030 to AD 1100. Based on other comparisons made in Anderson (1989:195), this point is placed in a much broader time span from AD 500 to AD 1400.

Figure 8.6. Projectile point 5LA05612.017.001.

A projectile point collected in 1983 was previously analyzed and placed in a broad

time span from 3000 BC to 300 BC. This specimen is typed as Category P45 (Anderson 1989:166-167). Category P45 specimens are thin and possess deeply indented bases, straight flanged stems, abrupt shoulders, and rounded tangs. The points are bi-convex in cross-section. No chronometric dates were available for this projectile point category at the PCMS. More recent investigations at the PCMS indicate the presence of other specimens that resemble this projectile point type. These include five examples found in Owens et al. (2000:261) and Owens and Loendorf (2002:150). None of these was recovered from dated subsurface deposits and some resemble the original projectile point descriptions better than others. These recently identified specimens indicate that Category P45 projectile points possess dull tips and straight to slightly convex blade edges, attributes not previously identified.

Cores One hornfels-basalt and four argillite cores were located in the field. Unfortunately, no other information was recorded on these artifacts. One additional core was recovered from near the surface of Test Unit 1. This artifact is a rotated core made of dull gray quartzite with 7 striking platforms and at least 11 flake scars. The core shows no use wear and has less than 50% cortex.

Flaked Lithic Tools The one flake tool (5LA05612.017.002) collected in 2003 is an angular flake of red chert with both bimarginal retouching and use wear (Appendix VI). Based on the color and glassy feel of the artifact, the raw material was most likely heat treated before modification. Only a small fragment of this lithic tool was recovered, therefore any classification of function is tenuous.

Non-tool Flake Lithic Debitage Sixteen lithic flakes were recovered from subsurface investigations. The data from those flakes recovered through excavation are combined with data from the 102 flakes analyzed in the field. The results are presented in Table 8.4. Argillite flakes make up 39.8% of the assemblage. Chert flakes make up 27.1% of the total and the quartzites combined comprise 26.3%. Silicified wood, chalcedony, and hornsfels/basalt comprise the remaining 6.8% of raw materials found. These raw materials are all found locally on the PCMS and required transport from only short distances.

The non-tool lithic assemblage is composed primarily of small- to medium-sized simple flakes. This may indicate that activities at this site included early- to middle-stage lithic reduction. The presence of six lithic cores and a relatively high percentage (32.2%) of flakes retaining some amount of cortex may lend support to this interpretation. However, two-thirds (67.8%) of the lithic flakes analyzed had no cortex and the assemblage included 11 complex flakes and 2 bifacial thinning flakes, indicating that there was at least some middle- to late-stage lithic reduction taking place as well.

Groundstone

Bedrock Metates Sixteen bedrock metates were recorded and mapped at this site. As stated earlier, it is believed that these include the four bedrock metates identified by DU as Features 2 - 5 on the original site form. All were situated on the bedrock above the drainage. The surfaces of all 16 are flat, exhibiting neither pecking or flaking. Three of the

Table 8.4. Surface and subsurface non-tool lithic debitage, 5LA5612

Material Type	Hornfels/Basalt				Dull Quartzite				Bright Orthoqua				Chert				Chalcedony				Silicified Wood				Argillite				Total	
	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	No.	%
Size Grade																														
>1"	0	0	0		7	0	7		0	0	0		3	0	3		0	0	0		0	0	0		9	0	9		**19**	**16.1**
1/2"-1"	4	0	4		7	1	8		5	1	6		10	0	10		0	0	0		1	0	1		17	0	17		**46**	**39**
1/4"-1/2"	0	1	1		4	1	5		3	1	4		9	6	15		0	1	1		1	0	1		14	1	15		**42**	**35.6**
<1/4"	0	0	0		0	0	0		0	1	1		3	1	4		0	0	0		0	0	0		5	1	6		**11**	**9.3**
Total	**4**	**1**	**5**	**4.2**	**18**	**2**	**20**	**17**	**8**	**3**	**11**	**9.3**	**25**	**7**	**32**	**27.1**	0	**1**	**1**	**0.9**	**2**	**0**	**2**	**1.7**	**45**	**2**	**47**	**39.8**	**118**	**100**
Flake Type (Ahler 1997)																														
Shatter	0	0	0		0	1	1		0	1	1		3	4	7		0	0	0		0	0	0		3	2	5		**14**	**11.9**
Simple	4	0	4		16	0	16		7	1	8		18	2	20		0	0	0		2	0	2		41	0	41		**91**	**77.1**
Complex	0	1	1		2	1	3		1	1	2		3	1	4		0	0	0		0	0	0		1	0	1		**11**	**9.3**
Bifacial Thinning	0	0	0		0	0	0		0	0	0		1	0	1		0	1	1		0	0	0		0	0	0		**2**	**1.7**
Total	**4**	**1**	**5**	**4.2**	**18**	**2**	**20**	**17**	**8**	**3**	**11**	**9.3**	**25**	**7**	**32**	**27.1**	**0**	**1**	**1**	**0.9**	**2**	**0**	**2**	**1.7**	**45**	**2**	**47**	**39.8**	**118**	**100**
Cortex																														
Present	0	1	1		5	1	6		2	1	3		5	2	7		0	0	0		0	0	0		21	0	21		**38**	**32.2**
Absent	4	0	4		13	1	14		6	2	8		20	5	25		0	1	1		2	0	2		24	2	26		**80**	**67.8**
Total	**4**	**1**	**5**	**4.2**	**18**	**2**	**20**	**17**	**8**	**3**	**11**	**9.3**	**25**	**7**	**32**	**27.1**	**0**	**1**	**1**	**0.9**	**2**	**0**	**2**	**1.7**	**45**	**2**	**47**	**39.8**	**118**	**100**

S=Surface
SS=Subsurface

grinding surfaces are generally circular, one is oval and all others are rectangular. Sizes of the ground areas range from between 10 to 60 cm in length and 8 to 55 cm in width. Striations and pitting are also absent on all bedrock metates. The smoothing of the sandstone surface ranges from light to heavy. Several of the surfaces are spalled with only portions of the grinding surfaces remaining.

Mano/Manuport One mano fragment and one manuport were also recovered from the surface. The mano is a sandstone cobble less than 50% complete that has a smooth grinding area on one surface. The manuport is a granite cobble that is slightly greater than 50% complete. Although this cobble shows little to no evidence of a grinding surface, the presence of this large river cobble at this site is assumed to be cultural since no similar materials occur in the specific area.

Faunal Material

A total of 593 bone specimens was collected from this site. Of those, 284 are from the excavation of Test Unit 1 and 297 are from Unit 2. Twelve are from the excavation of STPs. All of the bones from the STPs were unidentifiable; six of these had some degree of burning. A complete report on the analysis of faunal material from this site is found in Appendix I. A brief summary is presented here.

Of the 284 bones collected from Test Unit 1, 88.7% (252) were unidentifiable. Thirty-two are identifiable and include squirrel (1), salamander (1), amphibian (6), rodent (3), bird (2), and frog/toad (1). Other bone was simply categorized as small (3), small to medium (6), medium (1), large (1) mammal, and unidentifiable vertebrate (7). Seventy-three (25.7%) of the bones collected from Test Unit 1 are burned but only one bone had any evidence of other modification. This modification was attributed to animal gnawing.

The 297 bones collected from Test Unit 2 included a similar assemblage to that of Test Unit 1; however, one burned cottontail humerus was identified to species (*Syvilagus*) as was one woodrat humerus (*Neotoma*). Thirty-four pieces of burned bone account for 11.4% of the total. None of the bone collected from Test Unit 2 was modified.

Both test units were placed next to a drainage directly southwest of an area known to have had standing water in it as recently as 1983. Although it is possible that prehistoric inhabitants may have been taking advantage of the resources available in this area all of the bones found could also have accumulated naturally. Nearly one-fifth (19.1%) of the total faunal assemblage was burned to some degree although the bone was not associated with cultural features such as hearths or other areas of *in situ* burning that would indicate human occupation. The possibility exists that the burned bone may have come from hearth cleaning and discarded away from the hearth. Another source for the burning could be natural fires.

Macrobotanical

Seeds A total of nine seeds was recovered during subsurface testing. All of the seeds appear to be juniper berries in various stages of decay. The source of these seeds is undoubtably the nearby juniper tree.

Other Organic Materials

Gastropod/Shell Samples designated as gastropod (8) and as organic material/shell (7) were collected. Four gastropod samples were sent to High Plains Macrobotanical Services, Inc. for analysis (Appendix II). Three samples recovered from Test Unit 1 (5LA05612.017.049, 5LA05612.017.050, 5LA05612.017.054) yielded examples of Rocky Mountain Dagger (*Pupoides inoratus*), White Lip Dagger (*Pupoides albilabris*), Multirib Vallonia (*Vallonia gracilicosta*), and *Oxyloma* gastropods. A sample collected from Test Unit 2 (5LA05612.017.053) contained Multirib Vallonia and Rocky Mountain Dagger. According to Bach (2004), "None of the above species are good climatic indicators but rather represent terrestrial gastropods which live in conditions ranging from dry to damp areas and can be found in grasslands, shrublands, and woodlands."

Charcoal Fourteen charcoal samples were collected. Two samples were submitted for radiocarbon dating from Test Unit 1. These samples yielded calendar dates of AD 770 to AD 980 and 790 BC to 410 BC (Appendix III).

Historic Artifacts

Glass

One small fragment of brown bottle glass, probably from a beer bottle was recovered from Test Unit 1, Layer 3. Given the slope of the ground surface, it was determined that this glass actually originated from or near the ground level.

Conclusions

Site 5LA5612 is a large lithic and bedrock metate scatter that is primarily limited to surface artifacts. Shallow sediments extend over the majority of this site, with deeper sediments in the drainage. Test units and shovel test pits were placed in the drainage area to test for hearth features that were noted during the original survey, but which were not relocated, and to investigate areas with potential intact subsurface deposits. Charcoal collected from sequential layers in Test Unit 1 along with diagnostic artifacts from the surface indicate the possibility of two prehistoric occupations. The dates are on wood charcoal that we could not directly tie to artifacts, features or cultural horizons. The calibrated radiocarbon dates are 790 BC to 410 BC and AD 770 to AD 980. These date ranges fall into the Late Archaic Period of the Archaic Stage and the Developmental Period of the Late Prehistoric Stage (Zier and Kalasz 1999). The two projectile points may also indicate activities at this site during these same time periods. One point was placed in the broad time frame of 3000 B.C to 300 BC while the other was dated at AD 500 to AD 1400. The bedrock metates, along with the lithic artifacts, are evidence for food preparation, lithic reduction, and hunting.

The subsurface strata along the drainage are most likely a mixture of organic and inorganic sediments. The darker organic materials give the strata an ashy look. Erosion throughout the drainage could account for the presence of artifacts here and for the loss of cultural materials and features observed in 1983. Bioturbation from plants and animals might

explain the presence of the few artifacts found in the deeper strata. These artifacts, if they do originate from *in situ* cultural deposits, will likely not be impacted by military activities.

Management Recommendation

The depth of substantial deposits indicates a lack of potential for integrity and/or additional significant research potential. The level of testing conducted at this site is believed to be sufficient to determine that the site does not hold the potential to yield additional information significant to prehistory. Based on these observations the site is recommended as ineligible for inclusion in the NRHP. No further work is recommended.

CHAPTER 9
SITE 5LA6108

Introduction

This site is an extensive historic habitation/ranching site with a smaller prehistoric component. It is located between Horse Gulch and Stage Canyon on the Stage Canyon 7.5' United States Geological Survey quadrangle. Covering an area of 23,887 square meters or 5.9 acres, the site is at an elevation of 1579 m (5180 ft) above sea level (asl) on a broad northerly extending finger ridge of the Black Hills region of the PCMS. This ridge is bounded on either side by two south- to north-trending tributaries of Stage Canyon (Figure 9.1). The ridge top is open and is flat to slightly sloping with sandstone outcrops. The prehistoric component is centered around the largest of these outcrops at the western edge of the site. Tree covered slopes above the drainages are moderate to steep. The predominant vegetation is juniper, cholla, yucca, fringe sage, buckwheat, prickly pear cactus, mullein, shrubs, and various grasses (Figures 9.2 and 9.3).

Nine features were recorded in 1993 by WCRM, Inc. as part of a historical archaeology survey. These features included: two rock structures (Features 1 and 7), one stone foundation (Feature 2), one corral (Feature 3), two potential dugouts (Features 4 and 8), two possible privies (Features 5 and 9), and one possible animal shelter (Feature 6). The site was not recommended as eligible for inclusion on the NRHP due to the perceived shallow sediment depth within the architectural features, the surface artifacts, the littering, and the damage caused by military maneuvers (Carrillo et al. 1993).

Surface Investigation

During the 2003 field session a topographic map was created using a Total Station (Figure 9.4). The 2003 main site datum used the original rebar datum. Due to the size of the site, the datum was arbitrarily designated as 100mN and 100mE. The elevation of the datum was set at 100 m. Nine subdatums (A-I) were necessary to map the entire site. All structures and features were mapped as well as the boundaries of the prehistoric component.

FLC relocated the originally recorded features and added seven more features. The five new historic features include a large quarry or loading dock (Feature 11), two trash deposits (Features 12 and 13), a possible tent platform (Feature 14), and one cistern/well (Feature 15). Surface investigations also included the examination of historic artifacts in the two trash deposits.

A previously undocumented prehistoric component was identified within the boundaries of the historic site. The prehistoric component extends approximately 34 m north/south and 41 m east/west. This component consists of at least 118 flakes, three lithic cores, one bedrock metate, and one non-portable groundstone. In addition, one projectile

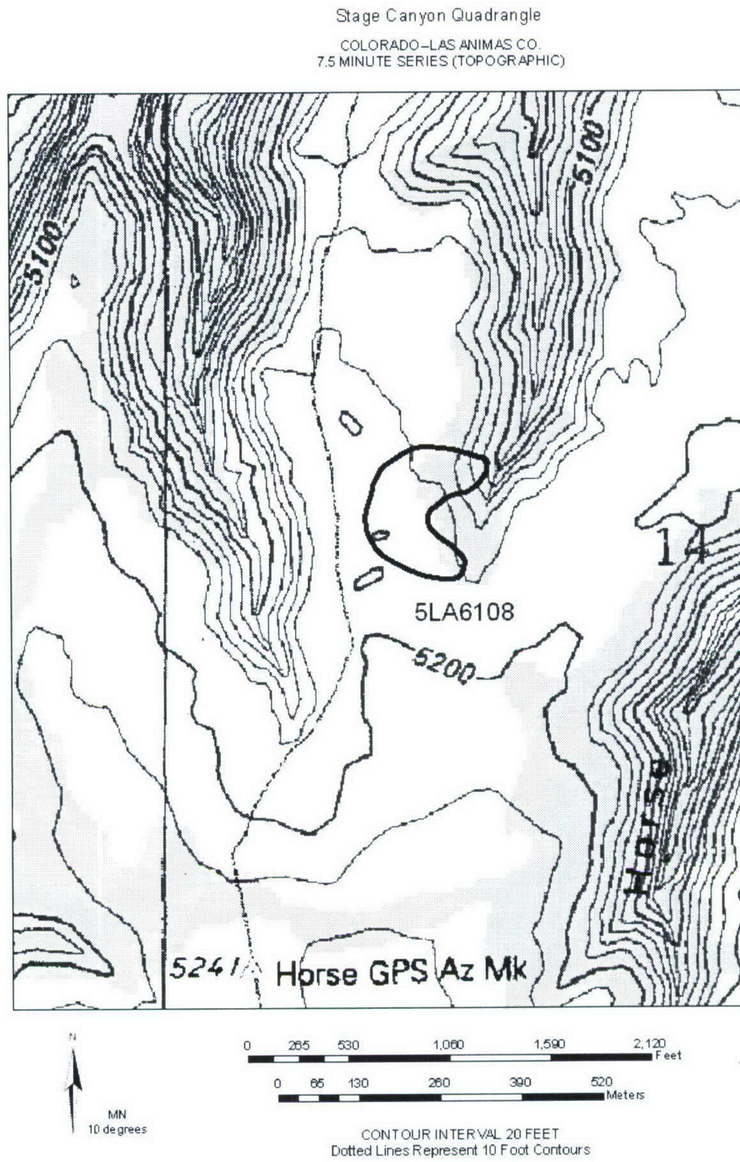


Figure 9.1. Location map, 5LA6108, PCMS.


Figure 9.2. Site overview, 5LA6108. View is to the north.


Figure 9.3. Site overview, 5LA6108. View is to the east.

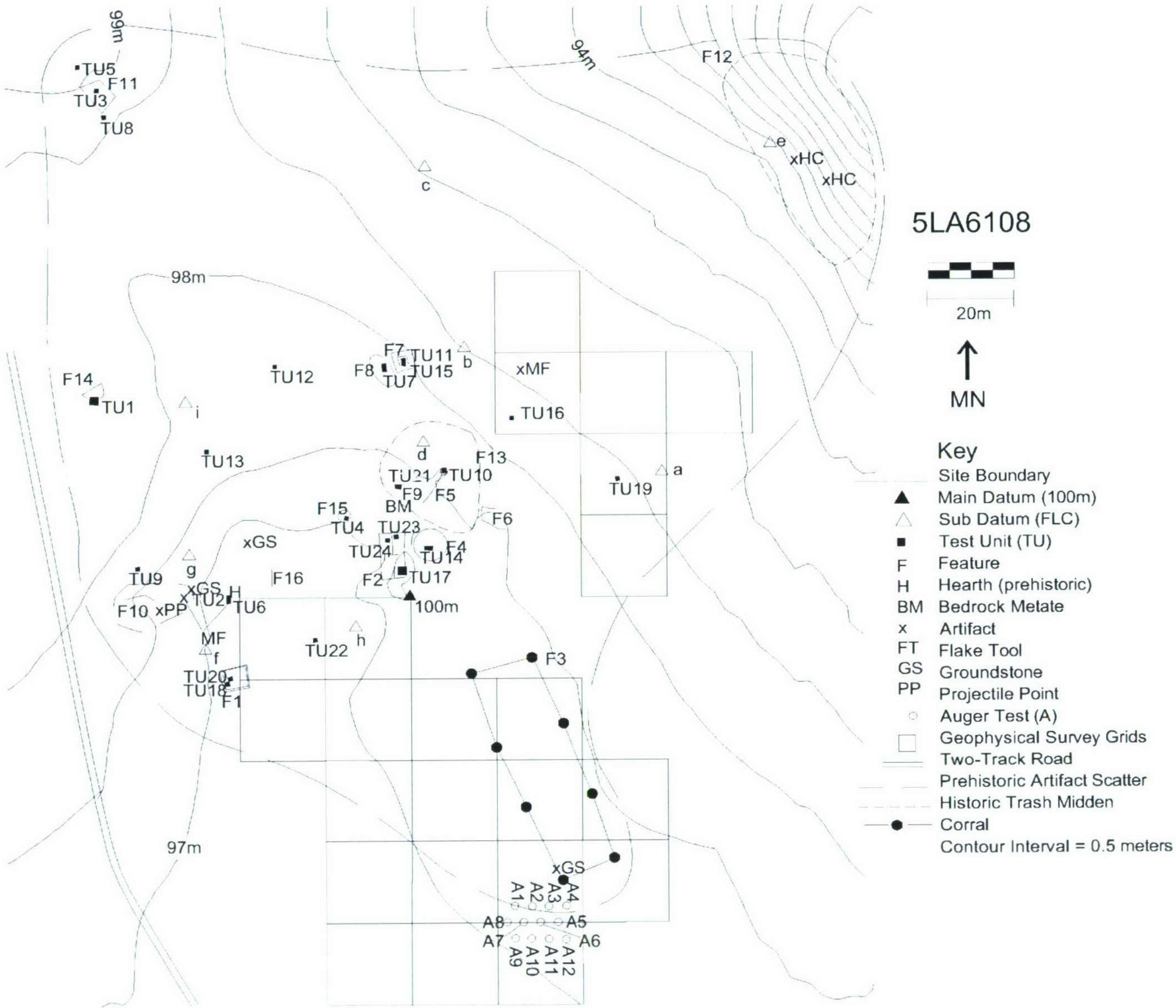


Figure 9.4. Site map, 5LA6108.

point, nine modified flaked tools, and three portable groundstone fragments were mapped and collected. Two diagnostic historic ceramics were collected from Feature 12. Two probable prehistoric features were also mapped. The prehistoric features (Features 10 and 16) consist of stone wall alignments associated with the prehistoric artifact scatter.

Features

Feature 1

Feature 1 is a rectangular, rock-walled structure built of local sandstone slabs and blocks (Figure 9.5). The structure measures 6.5 m (21.3 ft) by 5 m (16.4 ft). The south and west walls are still relatively intact and reach a height of 1 m (3.28 ft) while the north and east walls have collapsed. Two juniper posts remain at the outside of the southwestern and southeastern corners of the structure. These posts and the flatness of the remaining wall portions led the 1993 investigators to describe this structure as a seasonal habitation structure. It was speculated that additional height could have been added to the walls by using adobe or a tent-like structure utilizing wooden posts. One doorway was noted in the center of the east wall.

Figure 9.5. Feature 1, 5LA6108. View is to the west.

Feature 2

Feature 2 is a 11 m (36 ft) by 6 m (20 ft) stone foundation that likely represents the main domicile at this site (Figures 9.6, 9.7, and 9.8). The double-walled foundation is constructed of sandstone blocks and slabs; wooden posts remain at the inside of the four corners of the inner wall and at the mid-point in the western and eastern walls. Stone

construction inside the foundation indicates that the structure was divided into three rooms. Two doors are indicated by the presence of large flat stones. One doorway appears to lead to a sandstone path which leads to a privy (Feature 5). The path also passes

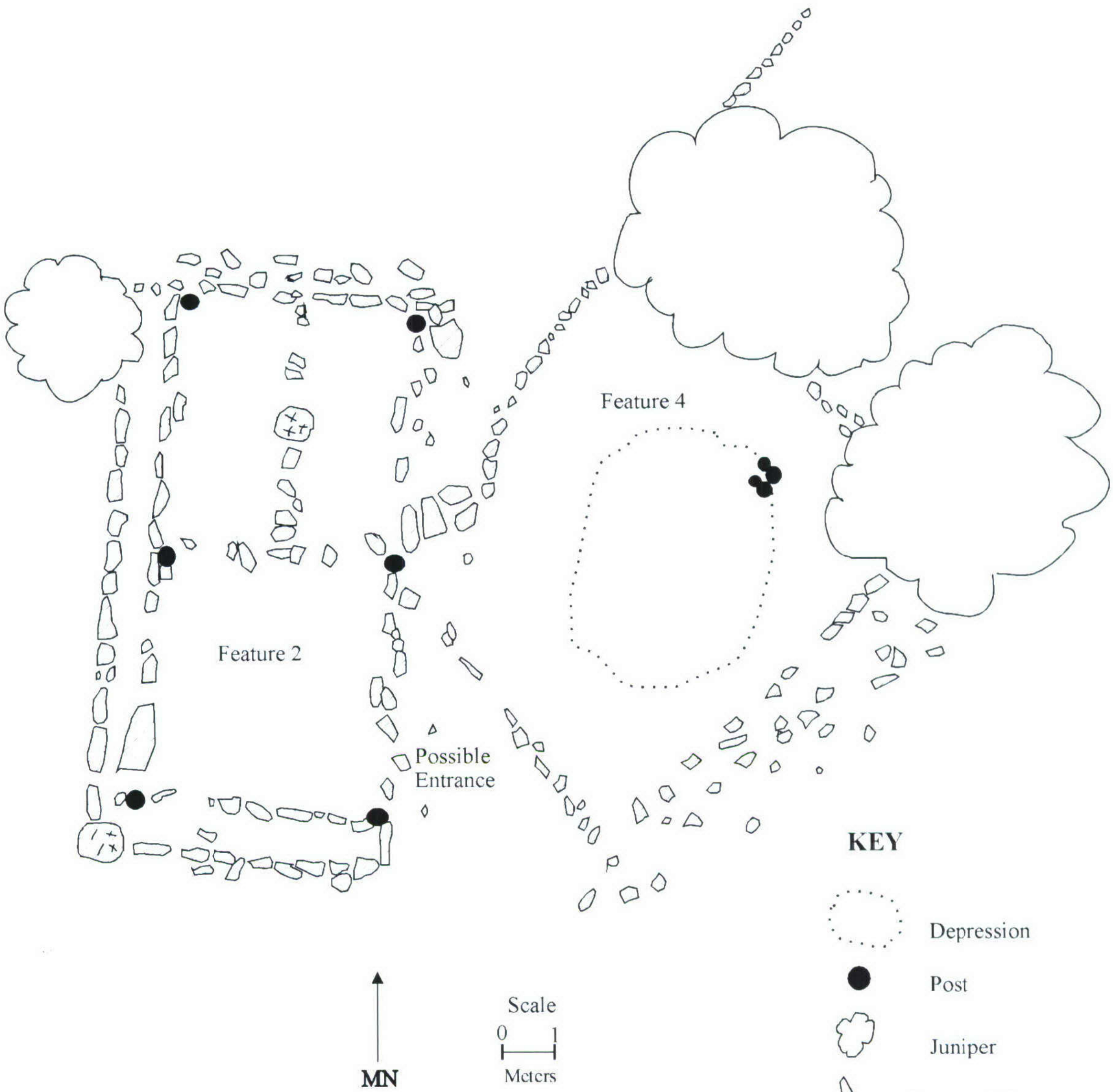


Figure 9.6. Feature 2 and Feature 4 planview, 5LA6108.

through a trash deposit (Feature 13). In 1993, artifacts observed in association with this feature included: a stove piece, a straight razor blade, a door key, a hinge lid pocket tobacco can, a small amount of white earthenware, window glass, bottle glass, and a concentration of coal.

Figure 9.7. Feature 2 north half, 5LA6108. View is to the north.

Figure 9.8. Feature 2 south half, 5LA6108. View is to the south.

Feature 3

This feature represents the remains of a corral measuring 57 m (187 ft) by 15 m (50 ft). Wooden posts and stacked stones remain at each corner and at the gate in the northwest corner (Figure 9.9). Although it is likely that the original corral was constructed of wooden posts and wire, it appears that the wire and most of the posts may have been scavenged. The corral is marked by cholla growing along the fence line (Carrillo et al. 1993).

Figure 9.9. Feature 3, 5LA6108. View is to the east.

Feature 4

Feature 4 was originally described as a circular dugout (Figure 9.6) with two center posts. It was believed that the posts could be remnants of a collapsed roof. The feature measures 7.5 m (25 ft) by 7.5 m (25 ft). The proximity of this feature to the domicile, Feature 2, contributed to its identification as a possible root cellar (Figure 9.10). The original investigators recorded a small amount of bottle/jar glass, metal cans, and metal cartridges in association with this feature; however, it was noted that the majority of the artifacts were outside the feature and may not pertain to the feature's function.

Figure 9.10. Feature 4, 5LA6108. View is to the northeast.

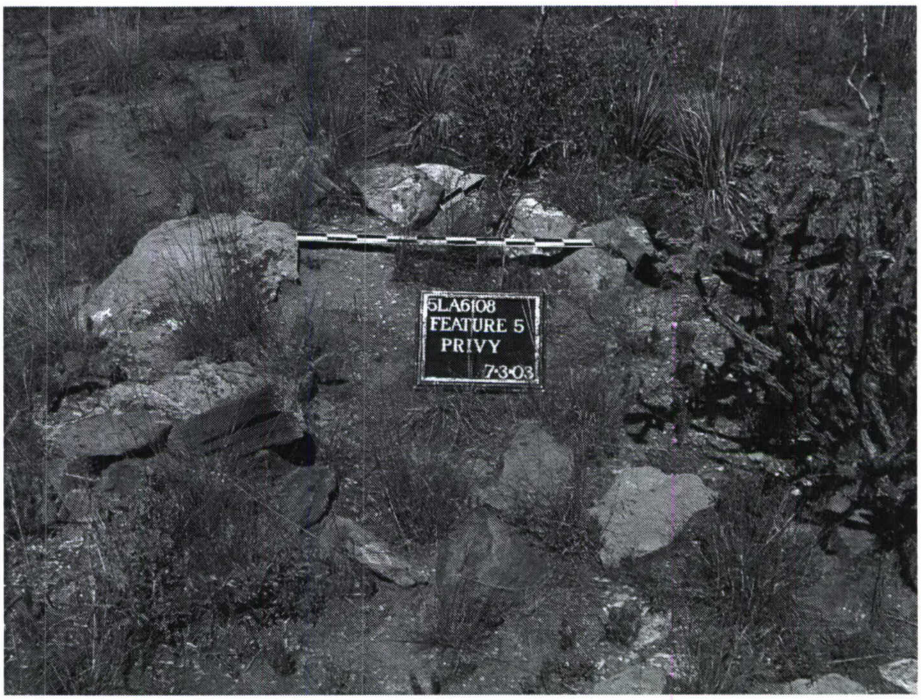


Figure 9.11. Feature 5, 5LA6108. View is to the west.

Feature 5

A sandstone-slab path leads from Feature 2 to this feature, believed to be the privy (Figures 9.6, 9.11, and 9.12). A low sandstone wall encloses three sides of a small depression. The feature measures 2 m (6.6 ft) by 2 m (6.6 ft). A wooden post is present in each corner on the outside edge of the wall. A moderately high percentage of artifacts was recorded in association with Feature 5 that included glass, crockery fragments, metal cans, a phonograph record fragment, an enamelware wash basin, a metal button, and burned bone. It was noted, however, that most were outside of the depression and part of Feature 13.

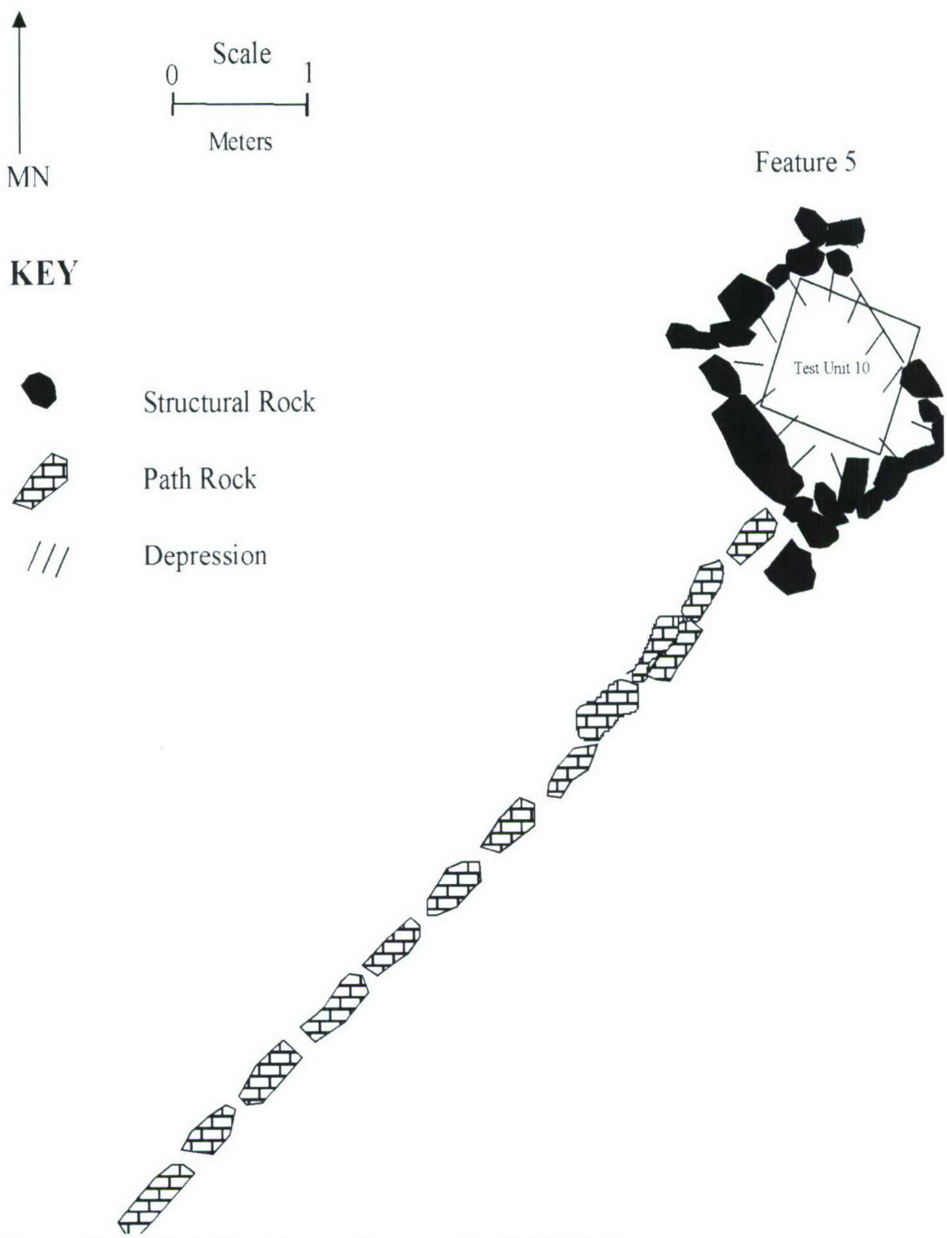


Figure 9.12. Path leading to Feature 5, 5LA6108.

Feature 6

Feature 6 consists of a low, dry-laid sandstone wall that curls around a small stand of juniper trees. Several branches were removed from the trees. Baling wire wrapped around a few of the branches and three pieces of milled lumber suggest that this may have been some kind of shelter or animal enclosure. The feature measures 4.5 m (15 ft) by 5.5 m (18 ft). No artifacts were observed inside the feature, a few artifacts were noted nearby.

Feature 7

Feature 7 is located to the north of the main complex of structures. It is a double-walled structure constructed from unshaped sandstone (Figures 9.13 and 9.14). Sediments probably filled the 8 to 12 inch (20 - 30 cm) space between the double walls.

Figure 9.13. Feature 7, 5LA6108. View is to the north.

The structure measures 4.7 m (15.4 ft) by 4.4 (14.4 ft). The four walls range from 1.3 - 1.6 m (55 to 66 inches) high. The doorway is in the south wall. No evidence remains for a roof. Few artifacts were observed, but milled lumber containing wire nails was recorded inside the feature. It was speculated that this double-walled structure may have been used as an icehouse/cold storage. A dugout (Feature 8) is immediately west of the feature.

Feature 8

Feature 8 is a semi-circular depression with possible juniper supports (Figures 9.14, 9.15). It is possible that the depression may have been partially walled. The size of the feature is 9 m (29.5 ft by 9 m (29.5 ft). The feature is adjacent to Feature 7. Both are north of the main site complex. The only artifact recorded in 1993 associated with this feature in was a fragment of baling wire.

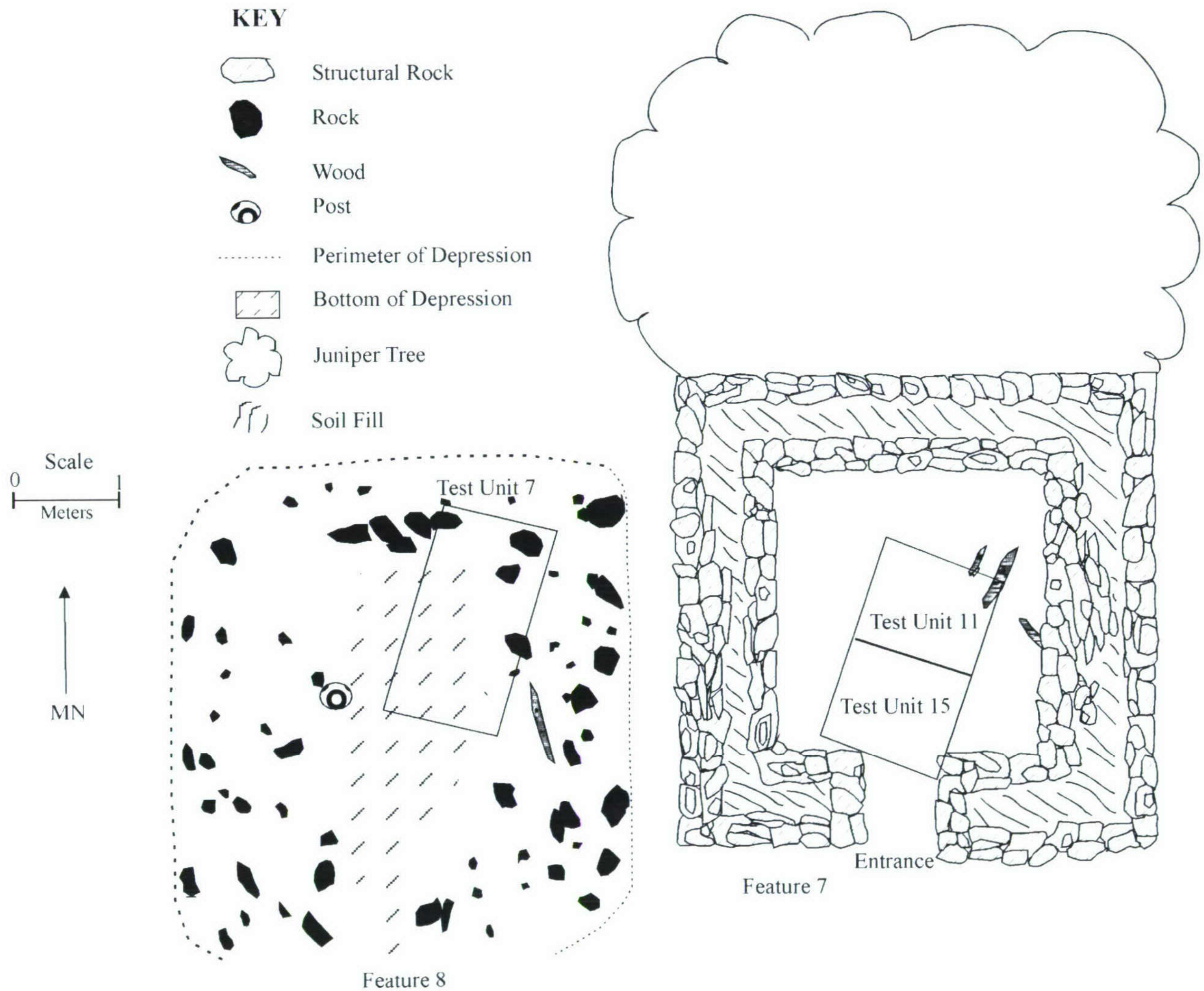


Figure 9.14. Features 7 and Feature 8 plan view, 5LA6108.

Figure 9.15. Feature 8, 5LA6108. View is to the north.

Feature 9

Feature 9 is located 10 m (30 ft) north of Feature 2, the large domicile structure. This low, square stone feature stands three courses high and was originally interpreted by the survey crew to be a privy (Figures 9.16 and 9.17). Three fallen timbers are located near the entrance to the structure and two pieces of metal wire hang from the tree next to the feature. One piece of wire is formed into a near perfect circle. The other piece of metal looks like strapping for a barrel. This feature measured 1.4 m (4.6 ft) by 1.2m (4 ft). Very few artifacts were visible on the surface because of the heavy juniper duff that covers the ground. A cast iron stove part and glass were noted in the vicinity.

Feature 10

Feature 10 is a low, L-shaped wall of dry laid, local sandstone blocks. Two large boulders of eroding bedrock make up part of the wall. The wall measures 7.3m (24 ft) by 2.6 (8.5) and averages .5 (1.65 ft) tall. Feature 1 is approximately 23 meters to the southeast. A prehistoric lithic scatter surrounds the feature and several quartzite flakes were found within the feature. A possible hearth was noted 4 m (13 ft) to the north. The absence of historic artifacts and the direct association of prehistoric materials suggest that Feature 10 is prehistoric. The lack of lichen growing on the wall, however, may indicate that the feature was used historically, possibly as an historic animal enclosure.

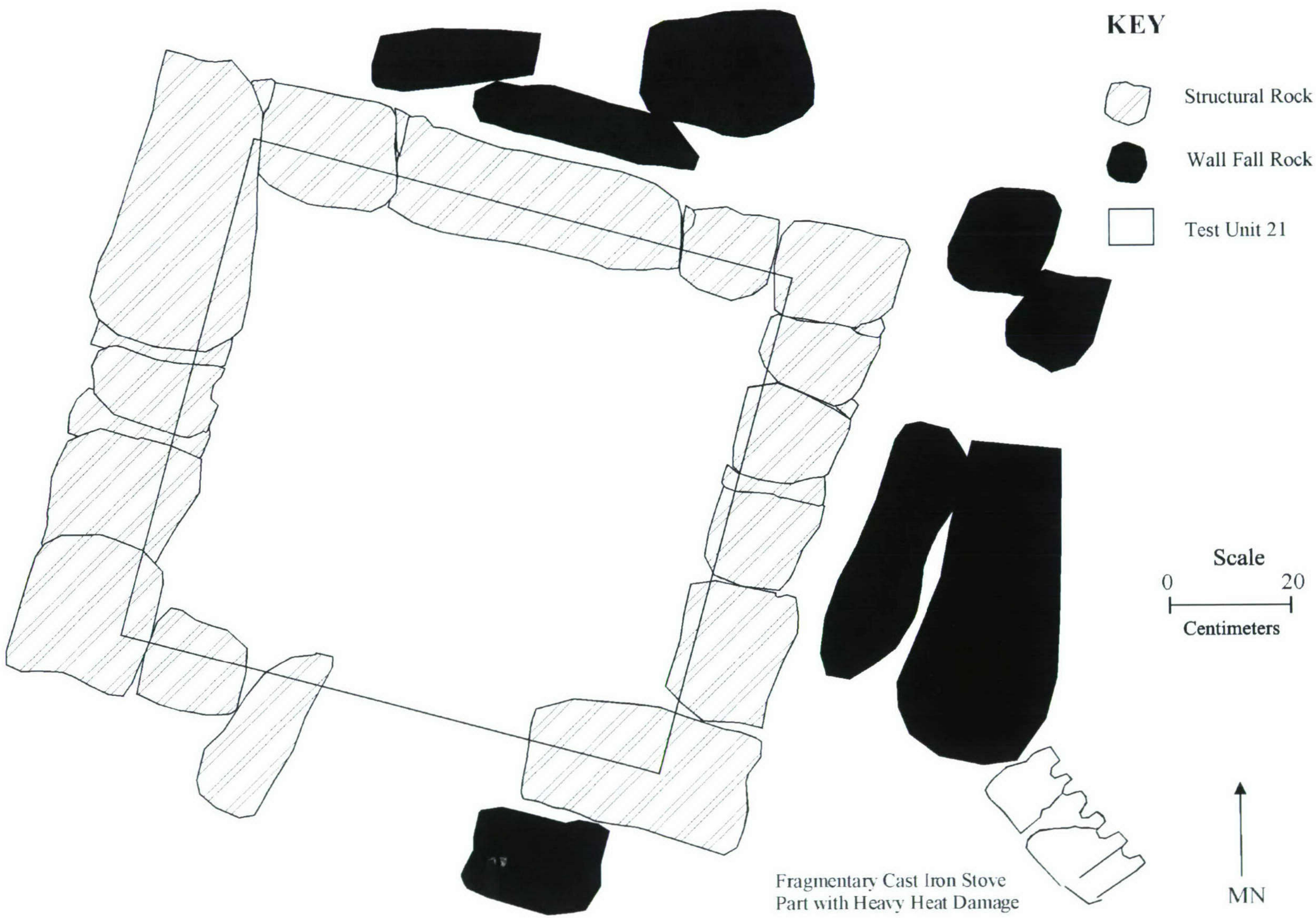


Figure 9.16. Feature 9 plan view, 5LA6108.

Figure 9.17. Feature 9, 5LA6108. View is to the north.

Feature 11

Feature 11 is a 6.5 (21 ft) by 8.5 (28 ft) by 1 m (3.3 ft) deep, U-shaped depression that was dug into a small slope on the north side of a saddle along the ridge top. The feature is located northwest of the main site complex and outside of the original site boundary. Two concentrations of sandstone slabs are on the slope and above the depression to the north. Another sandstone concentration is on the southeast corner. Some soil has been removed and piled on the east and west sides. Possible functions of the feature include a sandstone/clay quarry or a loading dock.

Feature 12

This feature is a trash dump containing metal cans, historic ceramics, and glass (See Table 9.20). It is clearly associated with the historic habitation of the site. The scatter is spread approximately 54 m (177 ft) by 23 (75 ft) along the west slope of a major drainage to the northeast of the main site complex.

Feature 13

Feature 13 is a trash scatter stretching 29m (95 ft) by 24 m (79 ft) along both sides of the sandstone walkway leading from Feature 2 to Feature 5. Feature 5 and Feature 9 occur within Feature 13. Artifacts visible on the surface include bottle glass, metal cans, and crockery.

Feature 14

Feature 14 consists of an irregularly spaced, oval alignment of approximately 20 small, unshaped sandstone boulders. The feature measures 5 m (16.4 ft) by 3.5 m (11.5 ft). A solid metal post protrudes about 16 cm above the ground surface. The post is about 2 cm (3/4 inch) in diameter. The head of the post has been heavily battered. A small number of historic artifacts were observed in the vicinity of this feature. It likely represents a tent platform.

Feature 15

This roughly rectangular depression measures 2.5 (8.25 ft) by 2.47 m (8.1 ft) and is 0.5 m (1.6 ft) deep (Figure 9.18). In 1993 this depression was recorded only as military disturbance. However, the presence of several pieces of coarse concrete and a timber near the surface led to speculation that the depression may have been a well or cistern.

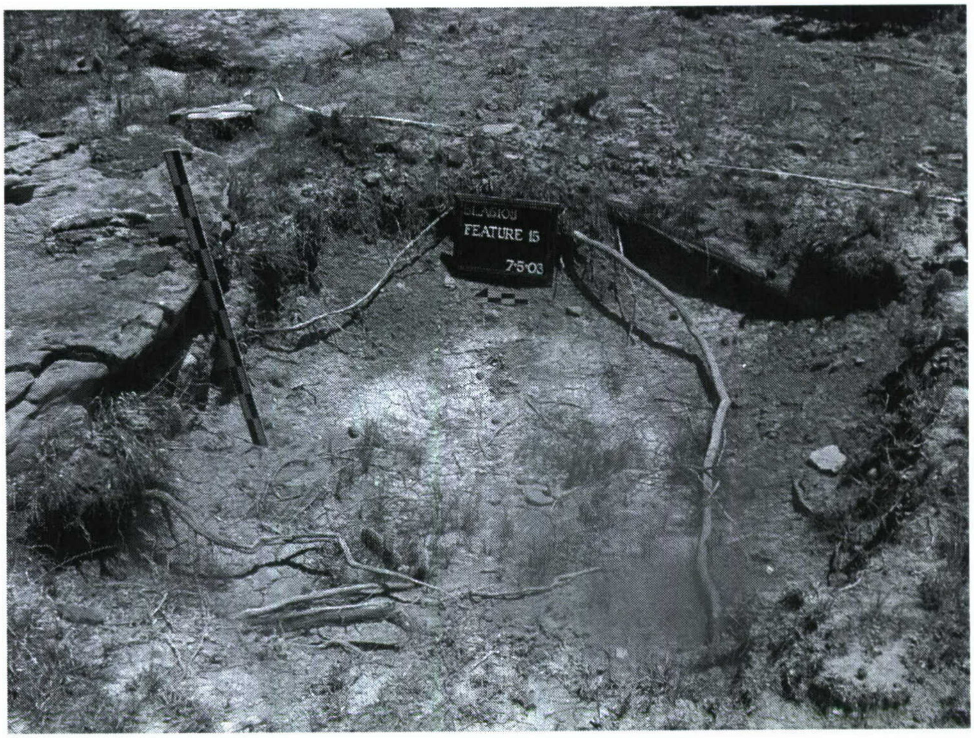


Figure 9.18. Feature 15, 5LA6108. View is to the east.

Feature 16

This is an ephemeral feature to the west of Feature 2. Several sandstone boulders, which may be cultural, abut a bedrock outcropping to the north. The feature is surrounded by juniper trees. The feature measures 5 m (16 ft) by 5 m (16 ft). A concentration of rock may represent a hearth in the southeastern portion of the feature. No charcoal or surface artifacts were recorded. The feature may be prehistoric.

Geophysical Survey

Twenty-three 20 m by 20 m grids were surveyed with both the resistance meter and the gradiometer (Figures 9.19). The results were limited, but some interesting features did appear in the remote sensing data that were not apparent from the surface. As a result of these surveys, we have recommended that fencing include these anomalies.

The gradiometer (magnetic) survey was conducted at 1 meter intervals and 8 points per meter (Figure 9.20). The gradiometer data from the grids was somewhat compromised because of the intensive heat (+ 105°) over several days during the first

session when the geophysical surveys were conducted. Several of the grids were resurveyed, but the data remain compromised in some grids due to the heat. Two areas of specific interest to the magnetic data include a scatter of metal artifacts in the northeast portion of the site east of the main structural features and a large magnetic anomaly in the extreme southern portion of the survey. One test unit was placed in the area of the metal scatter and it was determined that these artifacts were mostly can fragments and were either lying on the surface or were shallowly buried. No significant subsurface deposits were observed in this area. The second area of interest was a large semi-circular anomaly that appeared south and southwest of the corral. Additional grids were placed to the south and adjacent to the anomaly to determine its extent and perhaps its nature. The semi-circular pattern did not continue into the other grids as hoped but the anomalous readings did continue. This same area produced anomalous resistance readings as well (low resistance), and subsurface auger testing demonstrated that the soils here were very deep and moist, which was different than any of the other areas of the site where testing was conducted. No artifacts or cultural deposits were identified in the auger tests and the cause of the anomalous geophysical readings is inconclusive. At this time we are interpreting the cause of the anomalous reading as natural.

The resistance data was collected at 1 meter intervals and 2 samples per meter (Figure 9.21). The resistance data were a bit more revealing than the magnetic data. The underlying sandstone bedrock is clearly visible as high resistance anomalies in several areas of the site. Other than the subsurface geology, features that appeared in the resistance data include pathways, perhaps roads, and a large circular anomaly in the corral. The pathways are probably related to animal husbandry since they converge at the corral but not at the gate, which remains standing. The small gate that is visible today was most likely an access point for humans as opposed to the main animal entrance. The width of the gate is probably too narrow for large animals. The animal access was probably at another point along the corral, which is no longer visible from the surface. A circular resistance anomaly clearly appears within the southwest portion of the corral. It appears as a high resistance anomaly, much the same as the pathways leading into the corral. It is proposed that this feature may represent the location of a water tank. Another possibility is that it was a smaller corral inside the larger one. Another area of interest is the area outside of the corral and to the southwest. This area produced erratic electrical readings, and it is uncertain why this is the case. The same area produced anomalous magnetic readings as well. Auger tests demonstrated that the soils were deep here and that they contained more moisture that was normal in other subsurface tests at the site. Aside from the auger tests, none of the resistance anomalies were tested. But based on these results, we recommend that the fence, the pathways, and the corral be fenced to protect the larger site context.

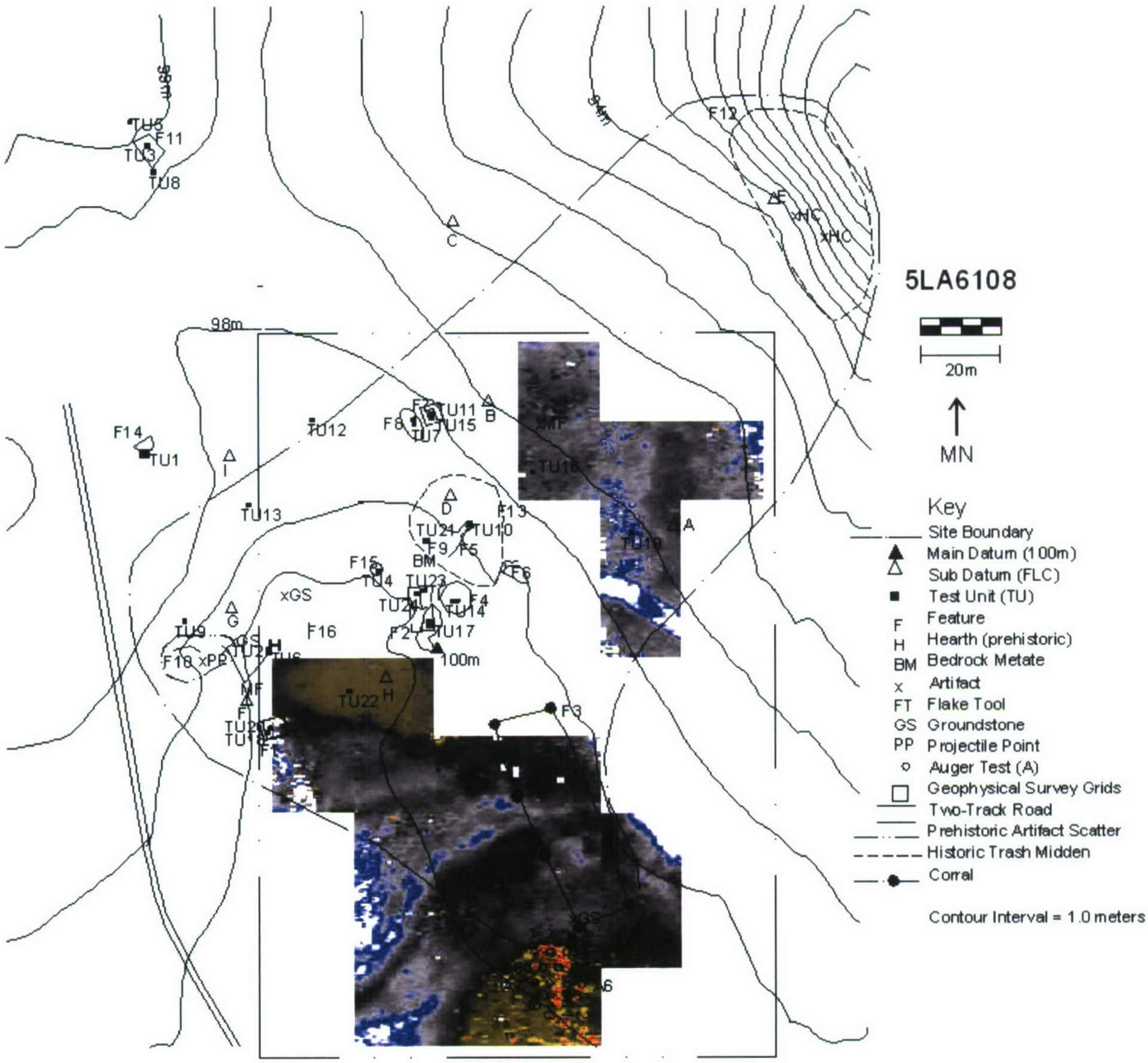


Figure 9.19. Electrical resistance grids superimposed over Autocad map, 5LA6108.

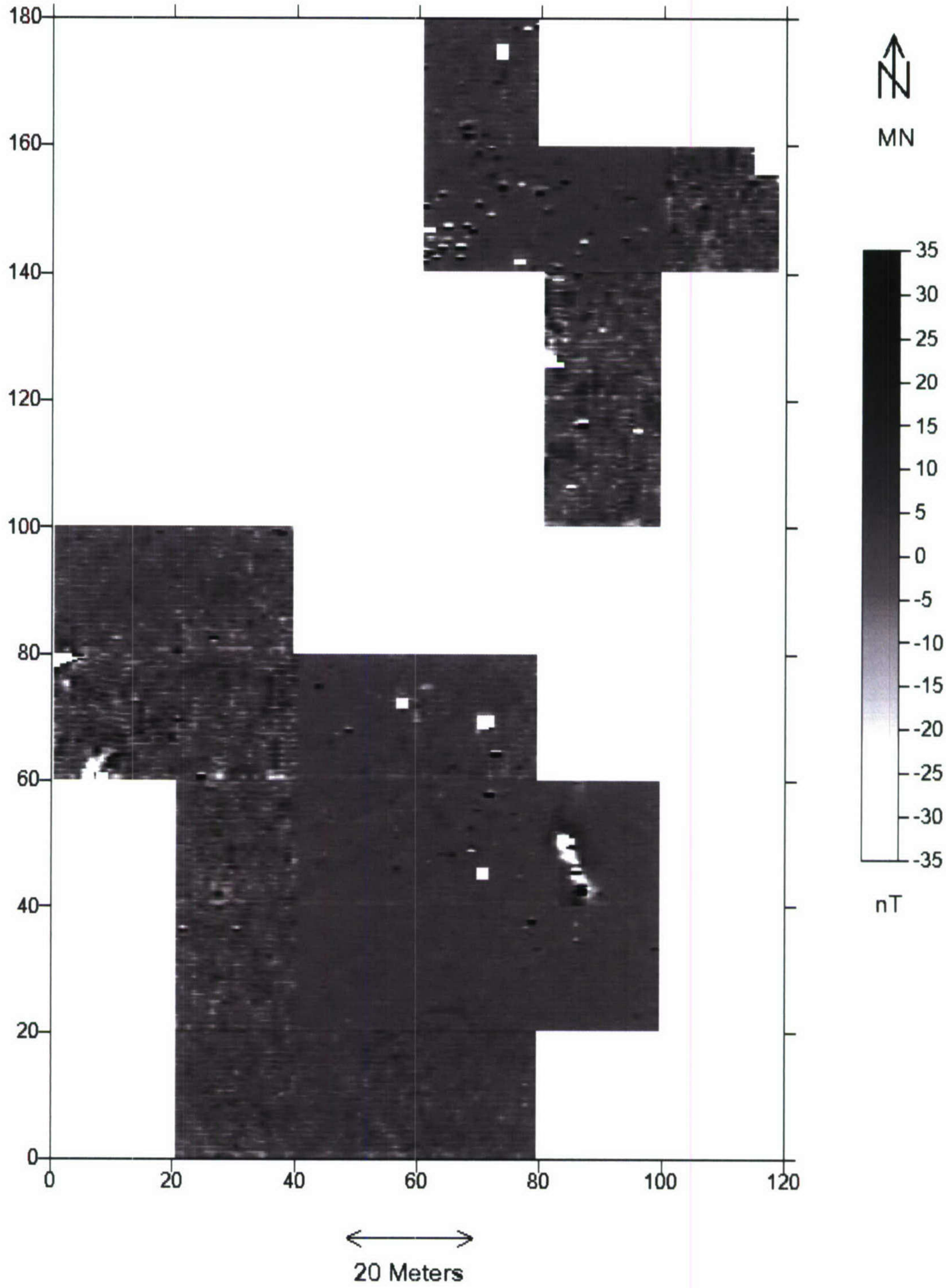


Figure 9.20. Magnetic gradiometer map, 5LA6108.

Subsurface Testing

Testing at the site included 24 test units and 19 auger tests (ATP). In several instances more than one test unit was excavated to test a single feature. Test Unit 1 was positioned in Feature 14 to test its interpretation as a tent platform. Test Units 2 and 6 examined the dark-stained area to the east of the large lithic scatter. Test Units 3, 5, and 8 were placed in Feature 11, the possible quarry/loading dock. Test Unit 4 was positioned in the depression originally believed to be caused by military disturbance (Feature 15). Test Unit 7 was excavated in Feature 8, the dugout to the west of Feature 7. Test Unit 9 tested for a possible hearth in a stained area to the north of the lithic concentration. Test Unit 10 was positioned in Feature 5 to investigate its interpretation as a possible privy.

Two units, Test Units 11 and 15, were excavated within the walls of Feature 7. Test Units 12, 13, 16, and 19 were extramural units placed to test the northern extent of subsurface cultural deposits. Test Unit 14 was placed in the large depression (Feature 4) presumed to be a dugout that lies to the east of the domicile (Feature 2). One test unit each (Test Units 17, 23, and 24) was excavated in the three separate rooms in Feature 2. Two test units, Test Unit 18 and 20, were excavated within Feature 1, the possible habitation/animal enclosure. Test Unit 21 explored Feature 9 to examine its possible use as a privy. The final test unit, Test Unit 22, was placed over a resistance anomaly in an area believed to have deep sediments. The goal of this test unit was to define the stratigraphy for the rest of the site.

Auger Test Probes

Their were two purposed in the placement of auger tests. Twelve ATPs were excavated near the south end of the corral to investigate a resistance anomaly found during the gradiometric survey. Seven ATPs were placed in the bottom of test units to explore the extent of subsurface deposits after culturally sterile sediments were reached.

Test Units

Test Unit 1

Test Unit 1 was a 2 m x 2 m test unit positioned to investigate Feature 14 and was excavated in two stratigraphic layers. Feature 14 represented a possible tent platform. The unit datum was set at the northeast corner of the test unit at 149.74mN, 27.57mE, at an elevation of 2.14 mbsd or an arbitrary elevation of 97.86 m. Control units were placed in each corner of the test unit. Layer 1 was dug as a single stratigraphic layer to a depth ranging from 2 to 5 cm. This layer consisted of loose topsoil containing grasses, cholla, prickly pear cactus, and other organic materials. A high level of disturbance from root growth was evident in the layer. One piece of miscellaneous metal was recovered from Layer 1 (Table 9.1). A layer change was made as sediments became more compact and sandstone gravels increased.

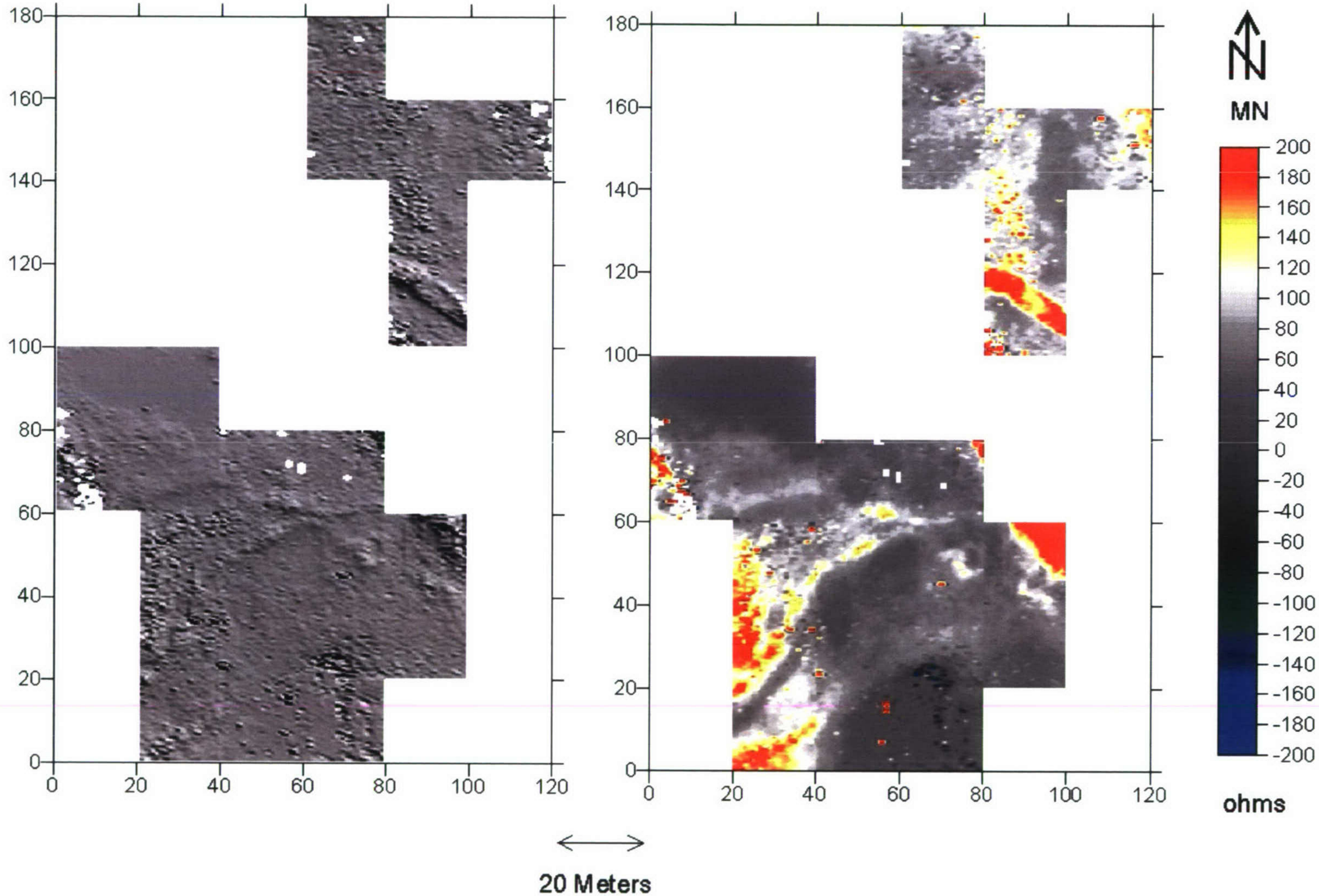


Figure 9.21. Electrical resistance map, 5LA6108.

Table 9.1. Test Unit 1 artifact summary, 5LA6108.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
1	Layer 1	*	2 - 5 cm	1 miscellaneous metal	2 gastropod sample, 1 shell sample, 4 macrobotanical samples
1	Layer 2	Level 1	5 - 10 cm	1 flaked lithic artifact	2 flaked lithic artifacts, 4 macrobotanical samples, 1 shell, 1 charcoal sample
1	Layer 2	Level 2	10 cm	None	2 flaked lithic artifacts, 3 macrobotanical samples

*Excavated as a single stratigraphic layer

Layer 2 ranged in thickness from between 15 to 20 cm and was excavated in two levels. Sources of bioturbation included root growth and a small ant hill. Lithic flakes and charcoal were collected from Layer 2. All but one of the lithic flakes were collected from the control samples. Excavation of the test unit was terminated after 10 cm of culturally sterile sediments were excavated. The final depth of Test Unit 1 ranged from between 19 and 22 cm bgs. After excavations were terminated, an auger probe was placed in the unit that extended an additional 72 cm below the test unit bottom. Sediments from the auger probe were light to dark gray with 40 to 80% gray shale gravels.

Two strata were identified in the south-facing north wall and the west-facing east wall of Test Unit 1 (Figure 9.22). These are described below.

Stratum I — Stratum I is a 4 to 10 cm, brown (10YR 5/3), angular, moderately well-developed sandy clay loam. The lower boundary is abrupt and smooth. No calcium carbonate is present. The stratum contains 5% poorly sorted sandstone gravels. Bioturbation by roots and insects is present. One historic artifact was recovered from this layer.

Stratum II — Stratum II is a light brownish gray (10YR 6/2), angular, well developed sandy loam. The matrix includes 15 to 20% sandstone gravels. Sediments show a violent reaction to hydrochloric acid. Bioturbation from roots and insects continues from the stratum above. The upper 10 to 15 cm of the stratum were exposed, the lower boundary remained concealed. Cultural materials were recovered from Stratum II.

Only one historic artifact, an unidentifiable piece of scrap metal, was recovered from this feature. It is likely that the rock alignment and metal stake are the remains of a tent platform; however, no artifacts were recovered to support this interpretation. The tent

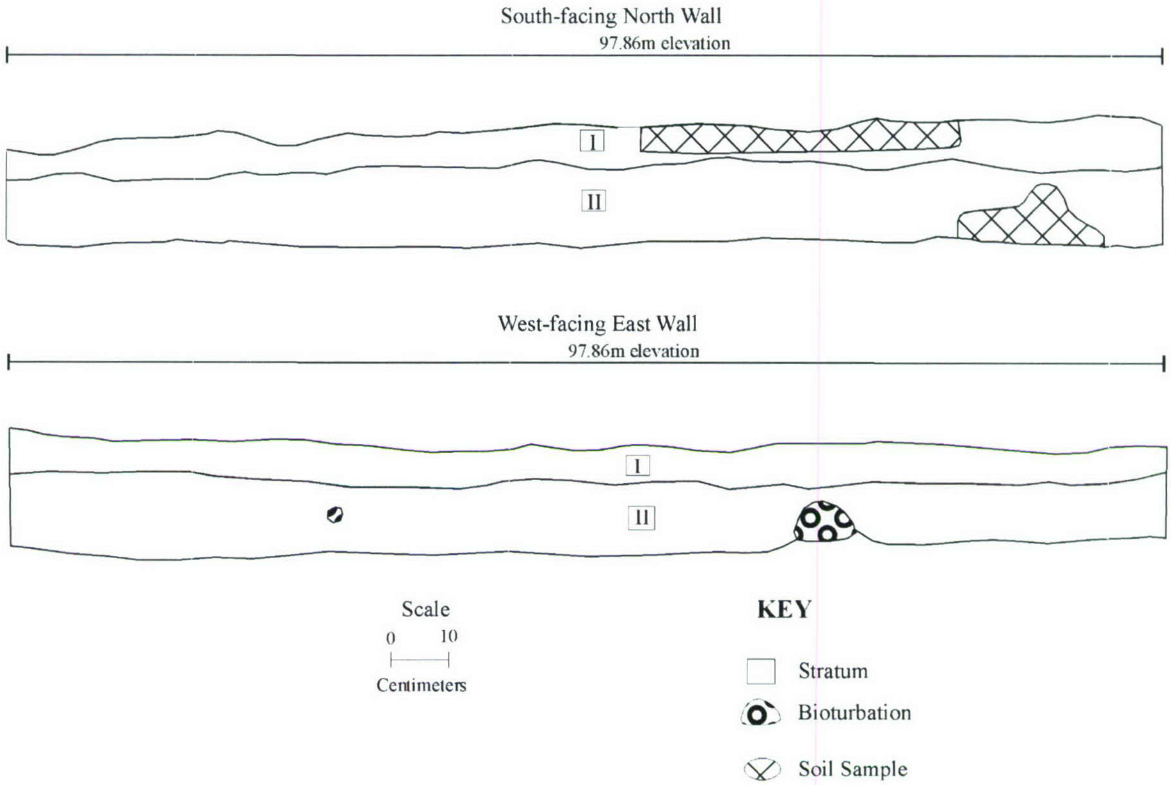


Figure 9.22. North wall profile and east wall profile, Test Unit 1, 5LA6108.

could have served as temporary shelter and other activities would have occurred elsewhere at the site. The lithic artifacts recovered are an extension of the site's prehistoric component.

Test Unit 2

Test Unit 2 was a 1 m x 1 m test unit placed to test for a hearth within an ashy stained area of the prehistoric lithic scatter. With the discovery of a hearth (Hearth 1) along the southern portion of the test unit, Test Unit 6 was opened adjacent to Test Unit 1 to expose the remainder of the hearth. The Test Unit 2 datum was set at 100.73mN, 58.04mE, at an elevation of 0.40 masd or an arbitrary elevation of 100.40 m. Layer 1 was excavated as a single 4 to 8 cm thick stratigraphic layer. The soil was loose and contained grasses, prickly pear cactus, and roots. The layer also contained a considerable amount of fire-cracked rock and two sandstone slabs. Flaked lithic artifacts, bulk bone, and a charcoal sample were collected from Layer 1 before a layer change was indicated as sediments became more platy to blocky and gravels increased (Table 9.2).

Layer 2 was a 6 to 10 cm thick single layer of dark gray to black platy sediments. Nearing the bottom of this layer, the sediments changed overall to a light color and became more compact but revealed a dark stained area in the southern portion of the unit. Flaked lithic artifacts and bulk bone were collected from Layer 2. At the appearance of a

possible feature, Test Unit 6 was opened to the south of Test Unit 2 and work on Test Unit 2 was terminated. The final depth of Test Unit 2 ranged from between 11 and 16 cm.

Table 9.2. Test Units 2 and 6 artifact summary, 5LA6108.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
Unit 2	Layer 1	*	4 - 8 cm	11 flaked lithic artifacts	2 flaked lithic artifacts, 1 charcoal sample, 1 bulk bone, 1 macrobotanical sample
Unit 2	Layer 2	*	6 - 10 cm	5 bulk bone, 1 flaked lithic artifact	4 flaked lithic artifacts, 1 bulk bone
Unit 6	Layer 1	*	2 - 7 cm	7 flaked lithic artifacts	2 flaked lithic artifacts, 10 bulk bone, 1 macrobotanical sample
Unit 6	Layer 2	*	4 - 8 cm	1 bulk bone	5 flaked lithic artifacts, 1 bulk bone
				Floatation Samples	
Hearth 1 N1/2	Layer 1	*	5 - 18 cm	3 flaked lithic artifacts, 35 bulk bone, 1 macobotanical sample	
Hearth 1 S1/2	Layer 1	*	5 - 18 cm	6 bulk bone, 1 macrobotanical sample	
Hearth 1	Layer 2	*		5 flaked lithic artifacts, 7 bulk bone, 1 charcoal sample	

*Excavated as a single stratigraphic layer

Test Unit 6

The datum used during the excavation of Test Unit 6 was .34 masd or an arbitrary elevation of 100.34 m. The unit was excavated in two layers to a final depth of between 9 and 13 cm. Layer 1 was very loose sediments with many rocks and roots throughout. Flaked lithic artifacts and bulk bone were recovered from the layer which reached depths of 2–7 cm below the ground surface (Table 9.2). A layer change was made as sediments became better developed and gravels increased to about 30% of the matrix. Layer 2 contained burned sandstone, flaked lithic artifacts, and a small amount of bulk bone. After excavating 4 to 8 cm the sediments became more yellowish and a darker area in the northern portion of the unit appeared. Excavations in Test Unit 6 were terminated in order to focus on the darker stain identified as Hearth 1.

Hearth 1 The hearth was defined at the base of Layer 2 in Test Units 2 and 6 (Figure 9.23). The sediments were dark brown to black and contained numerous cobble-sized, angular rocks. Roots were found throughout. The hearth was excavated in

Figure 9.23. Hearth 1, Test Unit 2 and Test Unit 6, 5LA6108. View is to the west.

threephases. The feature was bisected along the adjoining wall between Test Unit 2 and Test Unit 6. The north half of Layer 1 was removed until several large rocks appeared.

The same was done for the south half of Layer 1. Layer 1 reached a thickness of between 5 and 18 cm. After removal of the rocks, all of the remaining fill was excavated as Layer 2. The base of the hearth exposed a layer of sandstone and shale that was gray-stained. A large sandstone slab with gray staining on its underside protruded from the southeast wall of the feature and probably served as a deflector. The final dimensions of the excavated feature were 50 cm x 43 cm x 28 cm (Figure 9.24). All hearth fill was processed as a flotation sample. Flaked lithic artifacts, bulk bone, and charcoal were recovered from the sample.

The charcoal recovered from Layer 2 in Hearth 1 was sent to Beta Analytical, Inc. for AMS radiocarbon dating (Appendix III). The sample (5LA06108.000.306) provided a conventional radiocarbon age of 1410 +/- 40 BP (Beta 192260). The calendar corrected 2 sigma date range is AD 580 - 680. The intercept of the radiocarbon age with thecalibration curve is AD 650.

Macrobotanical samples collected from flotation samples were sent to High Plains Macrobotanical Services. These yielded 4 charred and complete juniper seeds, 18 charred and fragmented juniper seeds, and a charred juniper berry fragment. The complete results of the analysis conducted by High Country Macrobotanical services is presented in Appendix II .

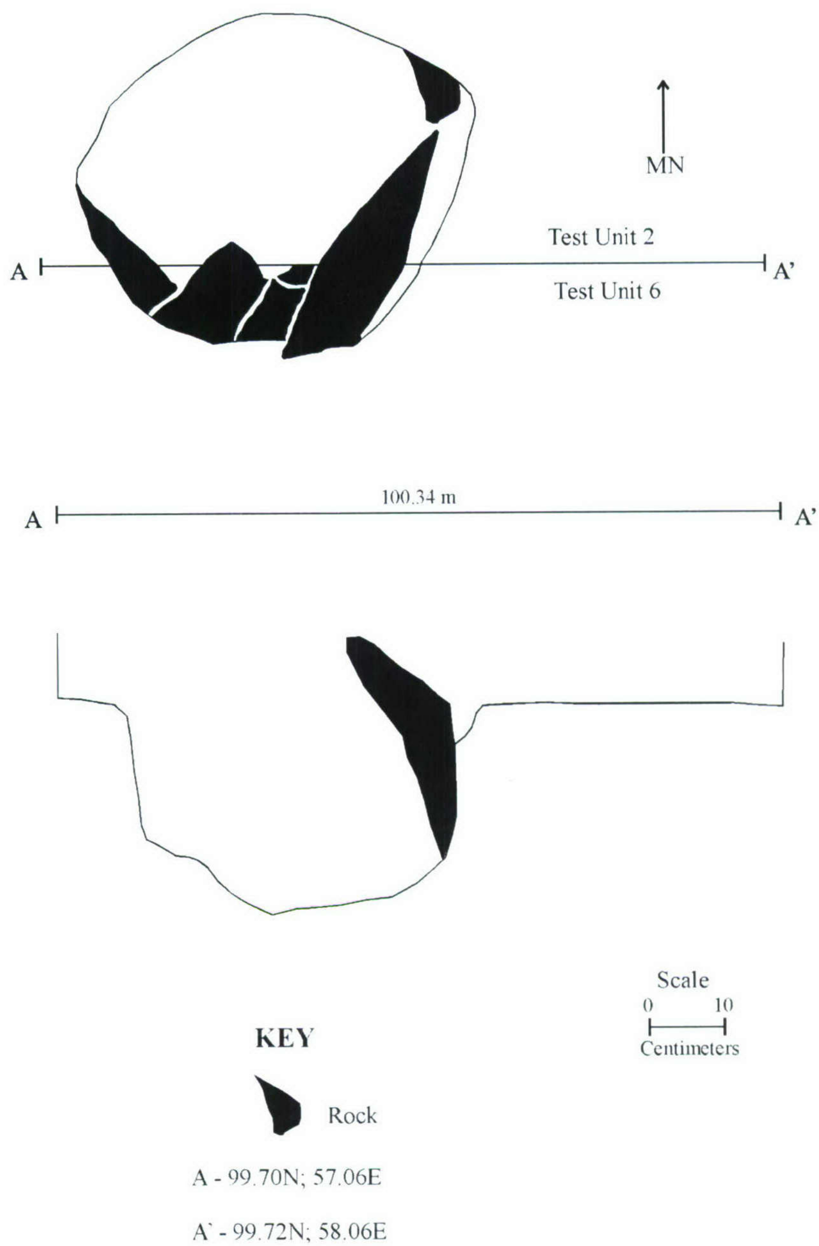


Figure 9.24. Hearth 1 plan view and profile, 5LA6108.

Two strata were identified in the 2 m long east-facing west wall of Units 2 and 6 (Figure 9.25).

Stratum I This stratum is 2 to 7 cm thick and a grayish brown (10YR 5/2), sandy loam with medium-sized grains. The sediments are single grained to platy, weakly developed with an abrupt and smooth to wavy lower boundary. The matrix is composed of 20% angular, poorly sorted gravels to cobbles and does not react to hydrochloric acid. There are some signs of bioturbation. Cultural materials were recovered from this stratum.

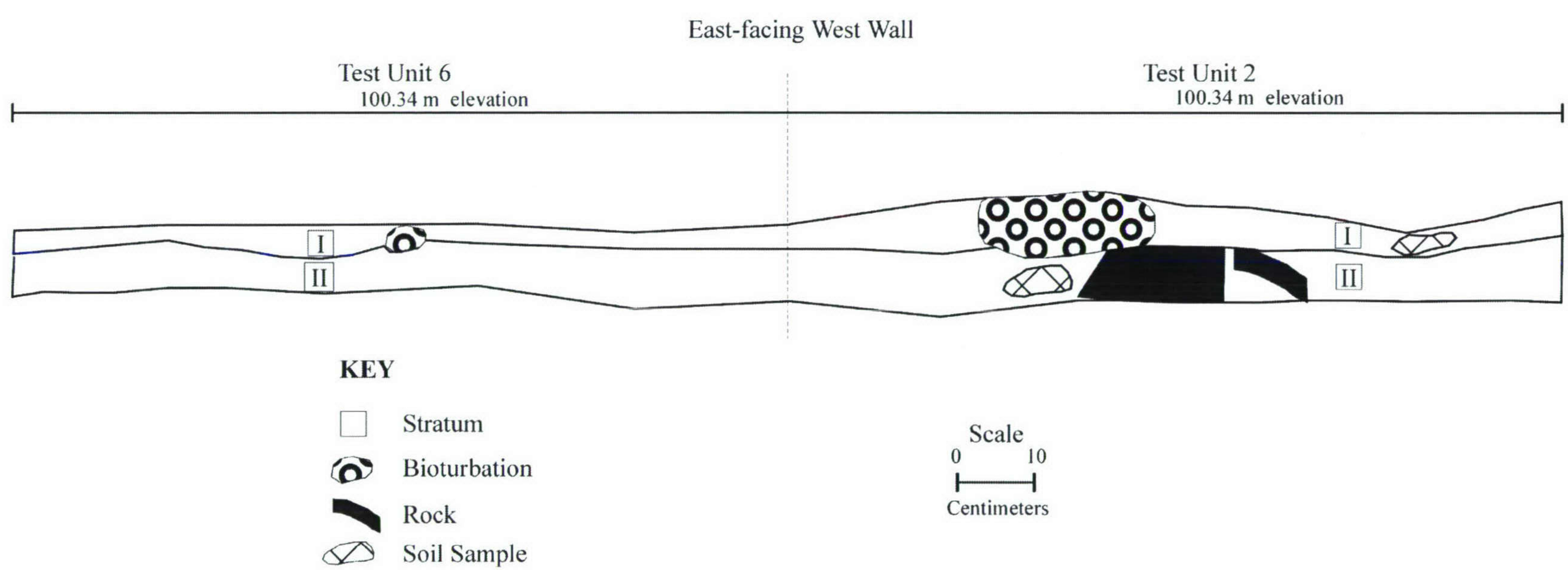


Figure 9.25. West wall profile, Test Units 2 and 6, 5LA6108.

Stratum II — Stratum II is 5 to 8 cm thick and is a grayish brown (10YR 5/2), fine-grained, loamy sand. The sediments are blocky, moderately developed and are composed of 7% angular, poorly sorted gravels to pebbles. Sediments display a moderate to violent reaction to hydrochloric acid. The lower boundary is abrupt, smooth to wavy. Cultural materials were collected from the stratum. Fragmented bedrock appears at the bottom of the stratum.

The area surrounding Test Units 2 and 6 was part of a prehistoric camp. A high percentage of lithic materials was recovered from these test units. A large lithic scatter lies just to the west and one bedrock metate was recorded in the vicinity of Hearth 1. Gray-stained sediments in the surrounding area may indicate the presence of more hearths even though portions of the area are heavily deflated. Excavations established the presence of a shallow, *in situ*, subsurface prehistoric component.

Test Unit 3

Test Unit 3 was the first of three test units (Test Units 3, 5, and 8) excavated in and around Feature 11, a possible loading dock or quarry. Test Unit 3 was a 1 m x 1 m unit placed inside the feature. The Test Unit 3 datum was placed at 225.21mN, 27.94mE, at an elevation of 1.61 mbsd or an arbitrary elevation of 98.39 m. No sod layer was present in Unit 3. It appears that the topsoil may have been removed down to sterile clay sediments in the construction of the feature. It also looks as if there is periodic water ponding in the feature. Only one stratigraphic layer, Layer 2, was identified during excavation and it was excavated in two levels. The sediments were moist and compact with a blocky soil development. No artifacts were collected from the test unit and excavations were terminated after two levels (Table 9.3). Test Unit 3 reached a final depth ranging from between 19 and 20 cm.

Table 9.3. Test Units 3, 5, and 8 artifact summary, 5LA6108.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
3	Layer 2	Level 1	9 - 10 cm	None	1 macrobotanical sample
3	Layer 2	Level 2	10 cm	None	None
5	Layer 1	*	3 - 5 cm	None	1 macrobotanical sample
5	Layer 2	Level 1	8 - 10 cm	None	1 macrobotanical sample
5	Layer 2	Level 2	10 cm	None	None
5	Layer 2	Level 3	4 - 11 cm	None	None
8	Layer 1	*	7 - 11 cm	None	1 macrobotanical sample
8	Layer 2	Level 1	6 - 10 cm	None	None
8	Layer 2	Level 2	10	None	None

*Excavated as a single stratigraphic layer

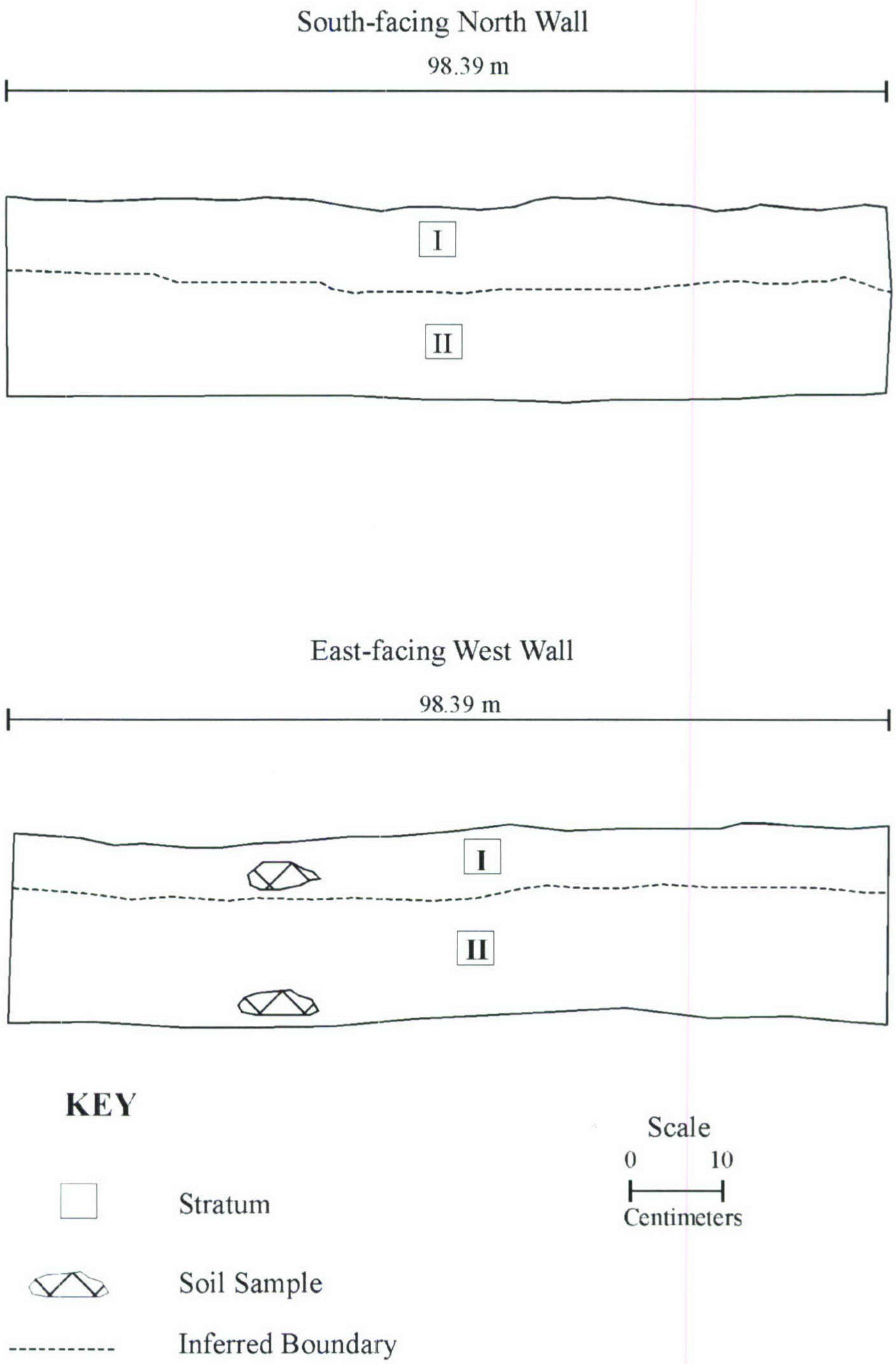


Figure 9.26. North wall profile and west wall profile, Test Unit 3, 5LA6108.

Two strata were identified in the south-facing north wall and the east-facing west wall of Test Unit 3 (Figure 9.26) and are described below.

Stratum I — This stratum is a brown (10YR 5/3), 6 to 10 cm thick, clay loam with a platy to weak blocky structure. The lower boundary is gradual and smooth. The sediments are bioturbated by roots and include less than 1% sandstone pebbles. There is a moderate to violent reaction to hydrochloric acid. No cultural material was collected from this stratum.

Stratum II — Stratum II is a grayish brown to dark grayish brown (10YR 5/2 - 4/2) clay that is mottled with brownish yellow (10YR 6/6), brown (10YR 5/3), very dark gray (10YR 3/1), and dark red (2.5YR 3/6) sediments. The sediments are moderately developed, blocky, and react moderately to violently to hydrochloric acid. Bioturbation from roots continues from Stratum I. The lower boundary was concealed. No cultural material was recovered.

<u>Test Unit 5</u>

This 1 m x 1 m test unit was placed to the north and above Test Unit 3 to investigate the rock pile/wall at the northern end of Feature 11, the depression. The unit datum was placed in the northeast corner at 231.20mN, 28.53mE, at an elevation of .61 mbsd or an arbitrary elevation of 99.39 m. Test Unit 5 was excavated in two stratigraphic layers. Layer 1 ranged in depth from 3 to 5 cm and consisted mainly of duff and eolian sediments. Layer 2 was excavated in three levels and ranged from between 24 and 29 cm thick. The sediments in this layer were weakly to moderately developed and contained a high percentage of sandstone pebbles/cobbles and roots. Cobbles encountered 10 to 15 cm above bedrock were heavily coated with calcium carbonate. No artifacts were recovered from Test Unit 5 and excavations were terminated when bedrock was reached (Table 9.3). The final depth of Test Unit 5 was between 28 and 34 cm bgs.

Two strata were present in the south-facing north wall and the west-facing east wall of Test Unit 5 (Figure 9.27), and they are described below.

Stratum I — Stratum I is a brown (10YR 5/3) sandy loam ranging in thickness from 5 to 10 cm. The sediments are platy to blocky and weakly developed. They are composed of 10% sandstone gravels and cobbles. The layer is bioturbated by roots and the sediments show a moderate to violent reaction to hydrochloric acid. The lower boundary is clear and smooth. No cultural material was recovered from Stratum I.

Stratum II — Stratum II is a 16 to 23 cm thick, brown (10YR 4/3), sandy loam. The sediments are weakly to moderately developed and blocky and are disturbed by root growth. The matrix is composed of 15 to 20% gravels and cobbles. The undersides of the cobbles near the bottom of the layer are covered with high concentrations of calcium carbonate. The sediments react violently to hydrochloric acid. The lower boundary is bedrock, which

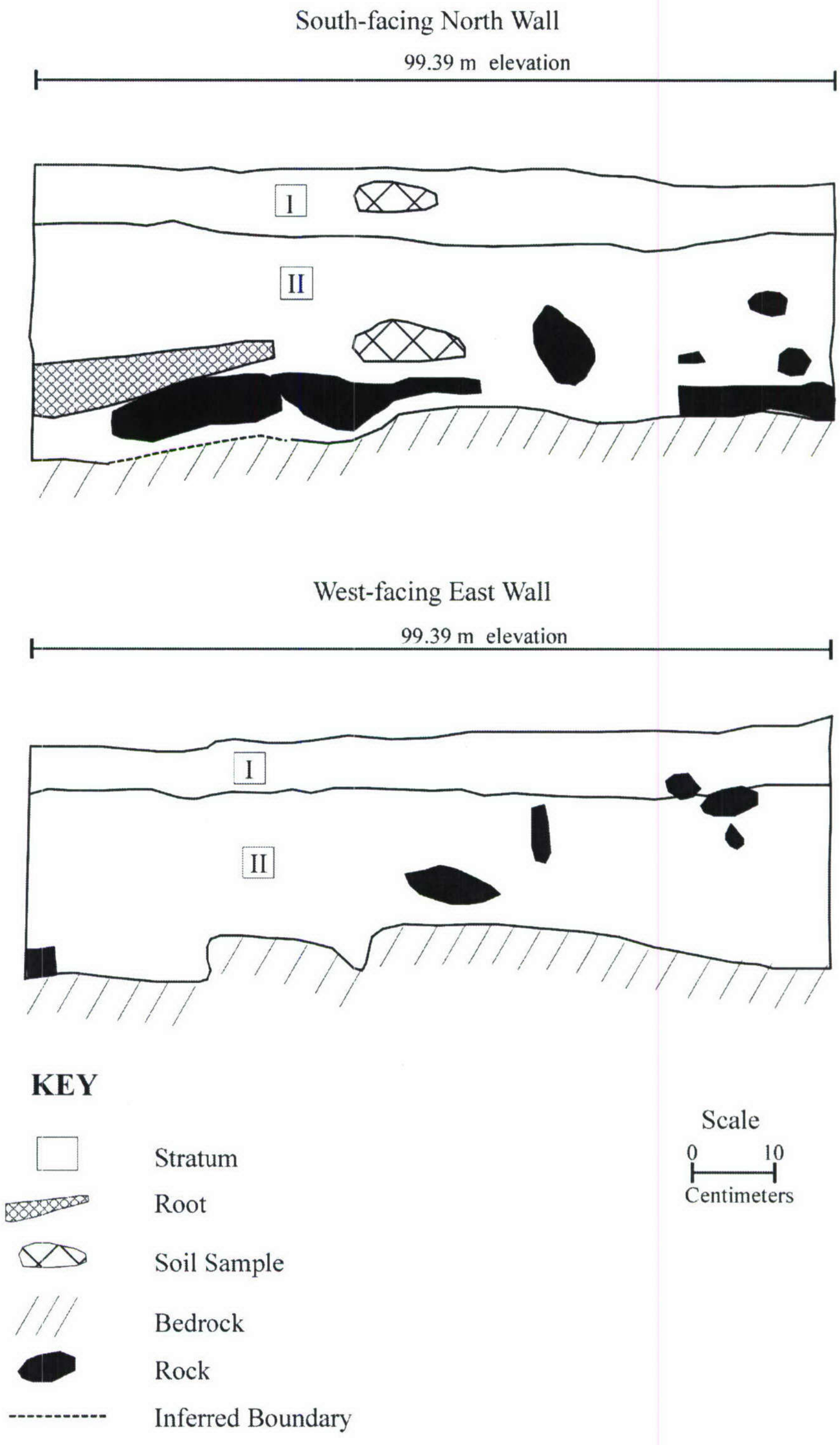


Figure 9.27. North wall profile and east wall profile, Test Unit 5, 5LA6108.

is very abrupt and irregular to wavy. No cultural material was collected from this stratum.

Test Unit 8

A final test unit was excavated in Feature 11 (Table 9.3). This unit was placed to the south and outside of Test Unit 3. The unit datum was placed at the northwest corner of the unit at 218.68mN, 28.53mE, at an elevation of 1.68 mbsd or an arbitrary elevation of 98.32 m. After Layer 1, it was necessary to reposition the datum to 218.93mN 28.86mE at an elevation of 1.76 mbsd for an arbitrary elevation of 98.24 m.

Layer 1 was a 7 to 11 cm thick layer of sod and loose sediments including at least 50% sandstone pebbles and cobbles. No cultural material was found in this layer. Although no color change was identified, a layer change was indicated as the soil became more structured and the percentage of gravels decreased. Layer 2 was excavated in two levels to a thickness of between 16 and 20 cm. Large roots were also present in the layer. No artifacts were collected from Layer 2 and excavations were terminated at a final depth of between 23 and 31 cm below ground surface.

Three strata were identified in the east-facing west wall and the south-facing north wall of Test Unit 8 and they are described below (Figure 9.28).

Stratum I — Stratum I is a 5 to 9 cm thick, gray (10YR 6/1 to 5/1) sandy loam with a weakly developed single-grained to blocky structure. The stratum also consists of 40 to 50% sandstone pebbles and cobbles. The sediments react slightly to hydrochloric acid and are bioturbated by root growth. The lower boundary is gradual and smooth. No cultural materials were present in this stratum.

Stratum II — Stratum II is 13 to 17 cm thick. The moderately developed, gray (10YR 6/1 to 5/1) sandy loam is angular and blocky and reacts moderately to violently to hydrochloric acid. Gravels decrease to less than 10%. Disturbance from root growth continues from above. The lower boundary is clear and smooth. No cultural materials were collected from Stratum II.

Stratum III — Stratum III is a well developed, blocky, light gray (10YR 7/2) sandy clay loam. Sandstone pebbles decrease to less than 1% of the matrix. Bioturbation from roots continues from the strata above. A high percentage of calcium carbonate is present. The lower boundary remained concealed. No cultural materials were recovered from this layer.

Several possible functions of Feature 11 were considered including livestock ramp, quarry, dugout, and loading dock. There was insufficient evidence gained from the excavation of three test units to support any of these possibilities. No historic artifacts were collected that might have linked this feature to the early 1900s ranching operations apparent at the rest of the site. In fact, given the distance of this feature from the main site complex, it remains possible that it is unrelated to the ranching complex.

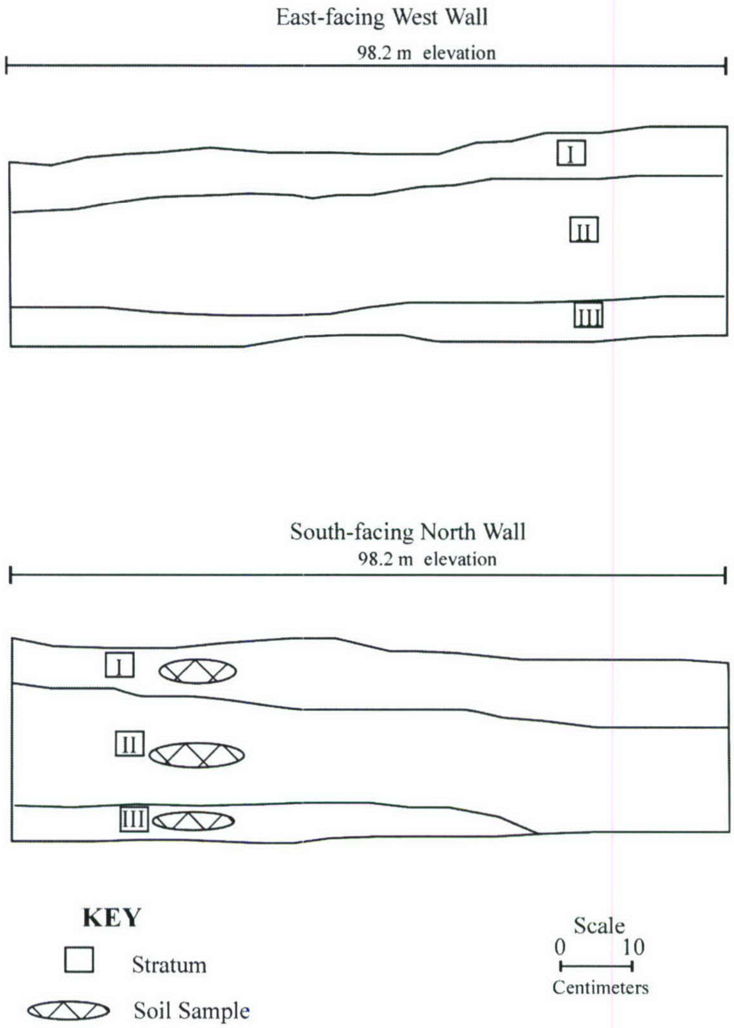


Figure 9.28. West wall profile and north wall profile, Test Unit 8, 5LA6108.

<u>Test Unit 4</u>

This 1 m x 1 m test unit was placed in Feature 15, interpreted to be a cistern or a well. The feature was originally documented as a military foxhole. The test unit was positioned so that it would capture part of the eastern wall if the feature was a cistern. The unit datum was set at 120.03mN, 84.66mE, at an elevation of 0.39 mbsd or an arbitrary elevation of 99.61. A large root originally believed to be a structural timber that spanned the length of the test unit was removed from Layer 1. Layer 1 was loose, platy, and light gray with a high amount of grasses and roots. The northwest portion of this unit was in the center of the feature depression where a fair amount of ponding had taken place. One piece of glass was recovered from the 4 to 10 cm layer excavated as Layer 1 (Table 9.4).

Layer 2 was a thick (20 to 57 cm) layer of dark, soft sandy sediments with a high concentration of rotting vegetation, roots, and other forms of bioturbation. Six levels were completed in Layer 2. The sediments became increasingly drier as excavations went

deeper. A stained area was noted in the eastern portion of the unit in Layer 2, Level 3. After completing four levels (20 to 35 cm) a curved concrete wall was revealed. Staining observed earlier may have been caused by organic material washed in along the wall when the feature filled. Excavations in the southeast corner of the test unit were discontinued at this point because that area was visibly outside the feature. Excavation of Layer 2 continued in the rest of the unit for an additional 20 to 22 cm until a layer change was indicated by the increase in rocks and concrete and because the sediments contained areas of dark mottling. Glass, bulk bone, a concrete sample, and one piece of metal were recovered from Layer 2.

Table 9.4. Test Unit 4 artifact summary, 5LA6108.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
4	Layer 1	*	4 - 10 cm	1 glass fragment	1 glass fragment, 1 bulk bone, 1 macrobotanical sample
4	Layer 2	Level 1	3 - 10 cm	1 glass fragment	1 macrobotanical sample
4	Layer 2	Level 2	7 - 10 cm	None	1 glass fragment, 2 bulk bone, 1 macrobotanical sample
4	Layer 2	Level 3	9 - 10 cm	3 glass fragments	1 charcoal sample, 1 macrobotanical sample
4	Layer 2	Level 4	0 - 10 cm	None	25 glass fragments, 1 macrobotanical sample
4	Layer 2	Level 5	0 - 12 cm	2 glass fragments	2 glass fragments, 1 macrobotanical samples
4	Layer 2	Level 6	0 - 12 cm	1 miscellaneous metal, 2 glass fragments	5 glass fragments, 1 concrete sample
4	Layer 3	Level 1	0 - 10 cm	None	2 flaked lithic artifacts, 1 macrobotanical sample
4	Layer 3	Level 2	0 - 21 cm	1 miscellaneous metal	2 flaked lithic artifacts, 1 macrobotanical sample
4	Layer 3	Level 3	0 - 12 cm	1 miscellaneous metal, 1 glass fragment	2 glass fragments
4	South Wall Removal	--	--	modern trash (MRE packaging), 1 miscellaneous metal	None

*Excavated as a single stratigraphic layer

Layer 3 was excavated in three levels. Sediments were removed from all but the southeast quarter of the test unit. The layer reached a thickness of between 40 and 44 cm. The sediments were dry and compact; the layer was also heavily bioturbated. High amounts of concrete wall slump were encountered. At the top of Layer 3 several large concrete slabs were visible. One slab was removed and had the word "July" etched in the slab. Another concrete slab, that remained embedded in the south wall, had the initials

"H.B." Two 10 cm levels and one 20 cm level were completed in Layer 3 to reach a greater depth and to uncover the concrete slabs in a shorter amount of time. Beginning with Layer 3, Level 2 the size of the control unit was reduced to 45 cm x 12 cm to facilitate movement within the test unit. In Layer 3, Level 3 the control unit was moved to the north wall. Metal, glass, and flaked lithic artifacts were recovered from Layer 3.

The excavation of Test Unit 4 was terminated at a final depth of between 94 and 102 cm bgs when it produced undeniable evidence of its original use as a cistern. Concern over the possible collapse of the concrete walls also prompted us to discontinue excavations. Four auger test holes were placed into the bottom of the test unit. Concrete fragments made it difficult to auger and the deepest auger test extended an additional 43 cm below the floor of the test unit. The probe came into contact with what was believed to be either the cistern floor or a large slumped concrete slab. Some modern trash was removed from the unit's south wall profile, 18 to 25 cm below surface. This MRE packaging indicates that later usage included military activities.

Four strata (I - IV) were identified in the east-facing west wall of Test Unit 4. Strata I - III, as well as Stratum V were delineated in the north-facing south wall of this unit (Figure 9.29).

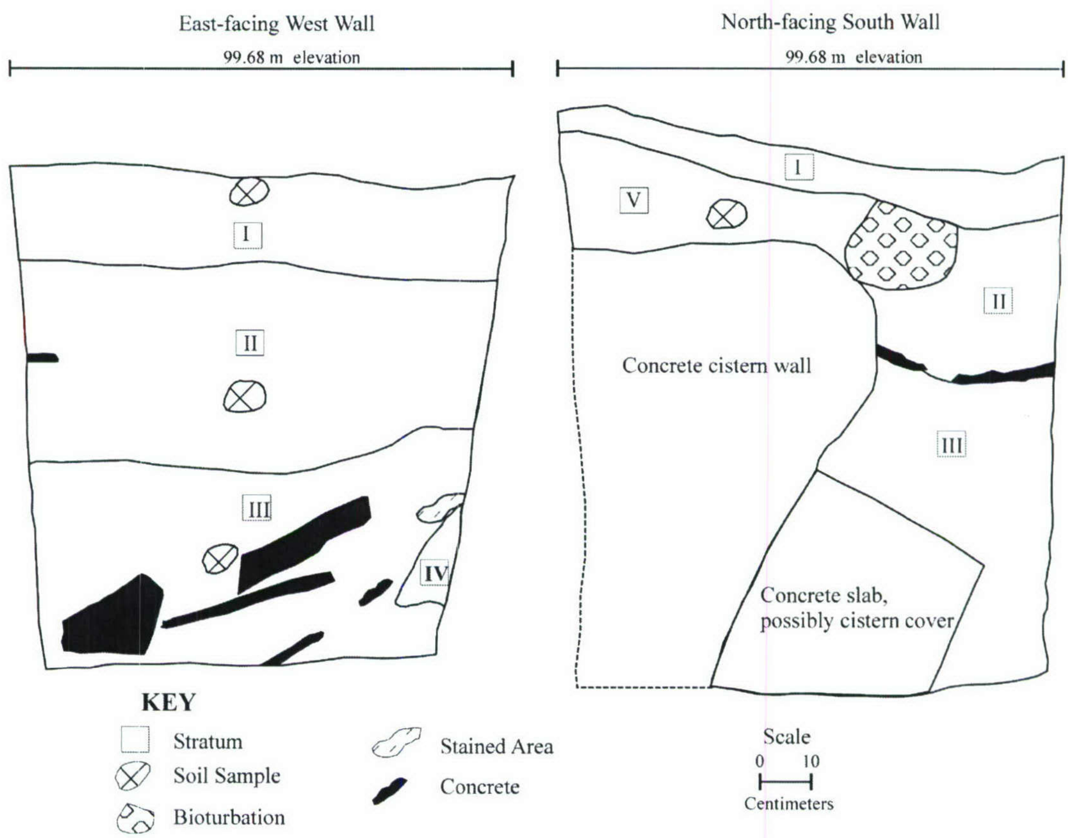


Figure 9.29. West wall profile and south wall profile, Test Unit 4, 5LA6108.

Stratum I — This 4 to 20 cm thick stratum is a light brownish gray (10YR 6/2), silty clay loam with a weak, platy structure. The lower boundary is gradual and smooth and the sediments react violently to hydrochloric acid. The matrix is composed of less than 3% angular gravels and is heavily bioturbated by plant materials. Cultural material was collected from Stratum I.

Stratum II — Stratum II is a thick (29 to 41 cm), pinkish gray (7.5YR 7/2), single grained clay loam with weak to moderate structure. Sediments react violently to hydrochloric acid. The layer contains 0 to 5% angular gravels. Bioturbation continues from above. The lower boundary is gradual and smooth. Cultural material was recovered from this stratum.

Stratum III — Stratum III is a gray (5YR 6/1), single grained, silty clay with weak to moderate structure. Sediments include 0 to 3% gravel and react violently to hydrochloric acid. Bioturbation is present in this layer as well. The upper 37 to 66 cm was exposed. The lower boundary remained concealed. Cultural material was collected from this layer.

Stratum IV — Stratum IV appears only in the north corner of the west wall within Stratum III. The reddish gray (10YR 6/1) silty clay is platy and weakly developed. The exposure is 19 cm long and 1 to 8 cm wide. The lower boundary is clear and smooth. The sediments include 0 to 3% gravels and exhibit a very violent reaction to hydrochloric acid. Because this stratum is only visible in a small portion of the profiled wall and it was not identified during excavation, it is not known if this stratum produced artifacts.

Stratum V — Stratum V was observed only in the eastern half of the north-facing south wall. This stratum is a 10 to 23 cm thick, light gray (10YR 7/2), silty clay loam. The sediments are well developed and platy and include 0 to 3% angular gravels. There is evidence of some bioturbation. Sediments reacted violently to hydrochloric acid. The lower boundary is clear and smooth. Cultural material was collected from Stratum V.

Four additional strata were observed in the sediments in the deepest auger probe. Sediments extending 15 cm below the bottom of Test Unit 4 are a grayish brown (10 YR 5/2) clay loam with a subangular blocky structure containing 0 to 3% gravels and a high concentration of calcium carbonates. From 15 to 23 cm in depth, the structure becomes more granular with a slightly higher percentage of gravels (0 to 5%). No color or textural changes were noted. The following 8 cm (24 to 36 cm) are a light grayish brown (10 YR 6/2), silty clay. The granular to subangular blocky structure continued from above as did the violent reaction to hydrochloric acid. Gravels decreased to between 0 and 3%. The final 7 cm of the auger probe (36 to 43 cm) are a clay loam; all other attributes are consistent with the above stratum. Concrete inclusions were found throughout the sediments in the auger probe.

Testing in Feature 15 conclusively showed that its original use was as a cistern. The initials found on the concrete slabs probably are associated with Henry Alfred Barnes, the documented property owner in 1922. The concrete slabs may have served as a cistern cover. This feature was also used by the military in more recent times. The square shape of the feature at the ground surface and during the first levels of excavation indicate that the depression shape was altered. The discovery of MRE packaging indicates military presence at the site. A foxhole was apparently superimposed over the cistern depression.

Test Unit 7

Test Unit 7 began as a 2 m x 1 m test excavation in Feature 8, the dugout west of the Feature 7. The unit datum was placed at 158.24mN, 94.95mE, at an elevation of 1.48 mbsd or an arbitrary elevation of 98.52 m (Figure 9.14). Seven levels were excavated in Layer 1 (28 to 50 cm) of loose, brown sediments containing 30 to 40% pebbles and cobbles. Because of the slope of the surface into the depression, the first four levels resulted in only partial excavation of levels across the test unit and no control samples were collected. Some concrete and sandstone gravels were noted. Control samples were collected from the southwest corners of the north and south halves of the test unit in Layer 1, Levels 5 and Level 6. In Layer 1, Level 7 the unit size was reduced to 1 m x 1 m. Only the south half of the original unit was excavated. Control samples were taken from the southwest corner for the remainder of the excavation. A layer change was made after seven levels were removed. The sediments became more compact and the sandstone pebbles and cobbles decreased. No artifacts were collected from Layer 1 (Table 9.5).

Table 9.5. Test Unit 7 artifact summary, 5LA6108.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
7	Layer 1	Level 1	0 - 10 cm	None	None collected
7	Layer 1	Level 2	0 - 10 cm	None	None collected
7	Layer 1	Level 3	0 - 10 cm	None	None collected
7	Layer 1	Level 4	0 - 10 cm	None	None collected
7	Layer 1	Level 5	10 cm	None	1 gastropod sample, 1 macrobotanical sample
7	Layer 1	Level 6	10 cm	None	1 macrobotanical sample
7	Layer 1	Level 7	10 cm	None	None
7	Layer 2	Level 1	10 cm	None	None
7	Layer 2	Level 2	10 cm	None	None
7	Layer 2	Level 3	10 cm	1 bone (tibia)	None

Layer 2 was excavated in three levels. The eastern portion of the unit was determined to be natural sediments representing the edge of the depression. The feature fill was brown, compact, and included 5 to 10% sandstone gravels. Layer 2 reached a

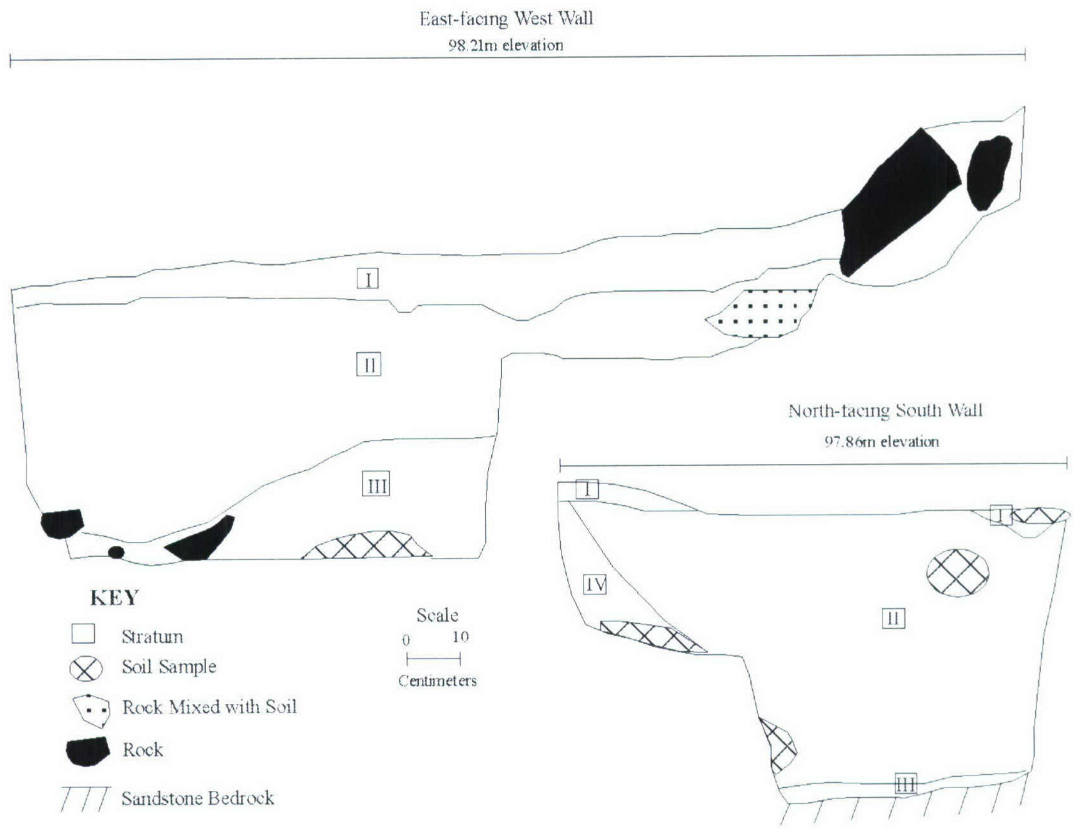


Figure 9.30. West wall profile and south wall profile, Test Unit 7, 5LA6108.

thickness of 30 cm. Near the bottom of Layer 2 a large tibia was recovered. No other cultural material was collected from the test unit. In the south half of Test Unit 7 the excavation reached a final depth from between 58 and 76 cm before sandstone bedrock.

Three strata were observed in the east-facing west wall of Test Unit 7; four were identified in the north-facing south wall and are described below (Figure 9.30).

Stratum I — This stratum is a 1 to 13 cm thick layer of grayish brown (10YR 5/2), coarse sandy loam with a subangular to blocky structure. The sediments are weakly developed and react only slightly to hydrochloric acid. The matrix is made up of 10% poorly sorted, angular pebbles and is bioturbated by roots. The lower boundary is abrupt and smooth. Sandstone slabs assumed to be wall fall were the only cultural material observed in this stratum.

Stratum II — Stratum II ranges from 1 to 55 cm thick. The sediments are a dark grayish brown (10YR 4/2), medium grained, sandy loam that is well developed with a subangular to blocky structure. Root disturbance continues from above; sandstone pebble and boulders increase to 30%. There is a moderate

amount of calcium carbonate. The lower boundary is abrupt and smooth. Bits of concrete and sandstone slabs were found in Stratum II.

Stratum III Stratum III is a layer of dark gray (7.5YR 4/0), silt loam ranging in thickness from 1 to 25 cm. The sediments are platy to granular and react violently to hydrochloric acid. Pebble inclusions increase to between 80 to 100% making this layer largely decomposing bedrock. The lower boundary is abrupt and smooth. One large bone was recovered from this layer.

Stratum IV This stratum appears only in the upper eastern corner of the wall and ranges from1 to 25 cm thick. It is a grayish brown (10YR 5/2), sandy loam with a moderately developed and blocky structure. The layer includes 40% angular, poorly sorted sandstone pebbles, and is bioturbated by roots and insects. The lower boundary is abrupt and smooth. No cultural materials were recovered from Stratum IV.

The upper portion of Feature 8 may have had walls stabilized with concrete and sandstone and the slabs appear to be cultural but the function remains unknown.

Test Unit 9

Test Unit 9 was placed near the northwestern end of the sandstone bedrock outcropping that bisects this portion of the site from the lithic artifact concentration. The 1 m x 1 m test unit was positioned to investigate a possible hearth in a dark stain, much like the staining observed in Test Units 2 and 6. The unit datum was originally set at 106.83mN, 36.93mE, at an elevation of 1.38 mbsd or an arbitrary elevation of 98.62m. Midway through the excavation of Layer 3, the datum was repositioned to 107.10mN and 37.13mE at an elevation of 1.42 mbsd or an arbitrary elevation of 98.58 m.

Layer 1 was a thin (1 to 4 cm) overburden consisting mainly of grasses, very loose single-grained sediments, and one large rock. The southwest corner of the test unit was heavily disturbed by root growth. A small amount of charcoal was recovered from Layer 1 before a layer change was indicated by a shift in the sediment color. One lithic artifact was recovered from the control sample (Table 9.6).

Table 9.6. Test Unit 9 artifact summary, 5LA6108.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
9	Layer 1	*	1 - 4 cm	1 charcoal sample	1 flaked lithic artifact, 1 charcoal sample, 1 marcobotanical sample
9	Layer 2	*	0 - 8 cm	1 charcoal sample	1 charcoal sample, 1 marobotanical sample
9	Layer 3	Level 1	5 - 10 cm	1 charcoal sample	None
9	Layer 3	Level 2	9 - 10 cm	None	1 charcoal sample, 1 marcobotanical sample

* Excavated as a single stratigraphic layer.

Sediments remained loose and single grained but the color ranged from a dark brown in the southeastern corner to a grayish brown in the northeast corner. A small amount of charcoal was collected from several darkly mottled areas. Like Layer 1, Layer 2 was excavated as a single stratigraphic layer. Layer 2 ranged in thickness from between 0 and 8 cm. No sediments were removed from the northwest corner of the test unit where the sediments were consolidated. A change to Layer 3 was made when sediments became much harder and more structured.

Layer 3 was excavated in two levels and ranged in thickness from between 15 and 20 cm. This layer was a sandy loam containing tree and grass roots and a few pebbles and cobbles. The sediments were compact with a blocky structure. Although several areas of gray mottling increased with the depth of the layer, these were most often associated with bioturbation, especially from a large tree root in the test unit's southwest corner. Excavation was terminated when a gray, tabular shale began to appear in the floor of the southwest quarter. A small amount of charcoal was recovered from Layer 3. Test Unit 9 reached a final depth of between 17 and 32 cm bgs.

Three strata were identified in the west-facing east wall and the north-facing south wall of Test Unit 9 (Figure 9.31).

Stratum I — Stratum I is a 4 - 9 cm thick layer of very dark grayish brown (10YR 3/2), sandy loam with a single-grained to platy structure. Sandstone gravels make up 10% of the sediments; no calcium carbonate is present. The lower boundary is abrupt and smooth. One flaked lithic artifact and charcoal were recovered from the layer.

Stratum II — Stratum II is a light yellowish brown to (10YR 6/4 - 5/4), sandy loam ranging in thickness from 6 to 9 cm. The small peds are blocky and moderately developed. Sandstone gravels remain at 10%. There is little or no reaction to hydrochloric acid. The lower boundary is clear and smooth. Charcoal was collected from Stratum II.

Stratum III — This dark, yellow brown (10YR 4/4), sandy loam has very small, crumbly, almost massively developed peds. Sandstone gravels decrease to 5% of the matrix. There is little or no calcium carbonate present in the stratum. The upper 17 to 27 cm of the stratum was exposed; the lower boundary remained concealed. A small amount of charcoal was recovered from this stratum.

Although small amounts of charcoal were collected from each of the layers only one lithic artifact was collected from the first 4 cm. The test unit was otherwise culturally sterile. There are no indications of *in situ* burning or ash deposits to provide evidence for a hearth in this location.

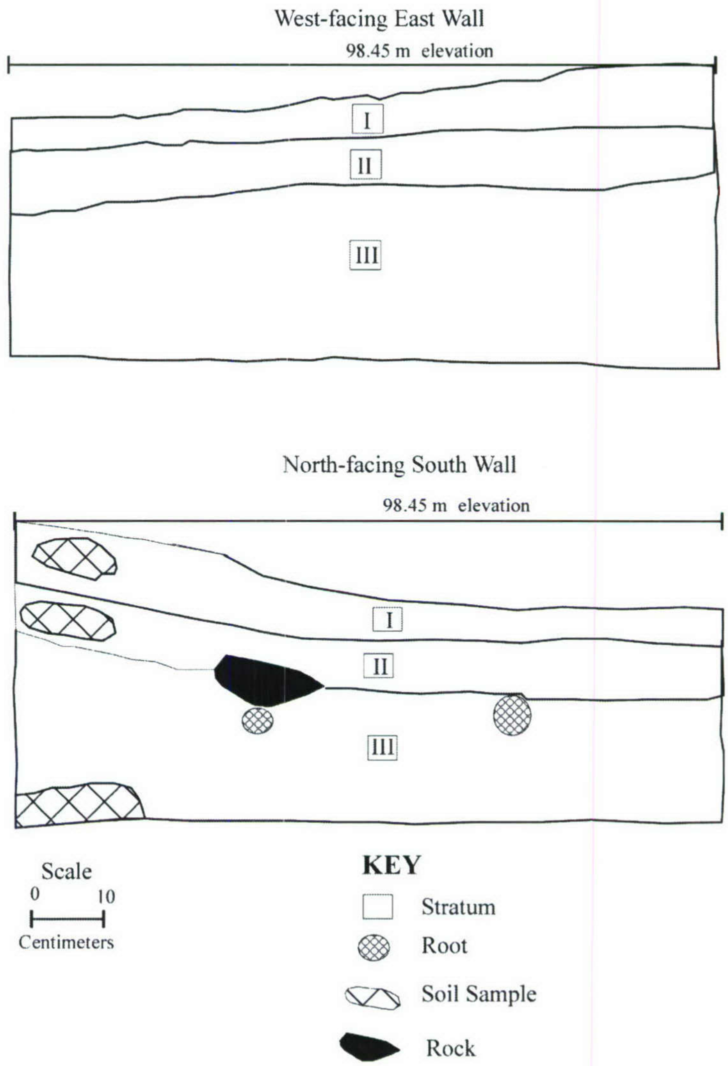


Figure 9.31. East wall profile and south wall profile, Test Unit 9, 5LA6108.

Test Unit 10

Feature 5 was interpreted as a privy. Test Unit 10, a 1 m by 1 m unit, was placed within Feature 5 to test this interpretation. Two layers were excavated in the feature (Table 9.7). The unit datum was positioned at 131.04mN, 108.97mE, at an elevation of 0.96 mbsd or an arbitrary elevation of 99.04 m. Layer 1 consisted of two partially excavated levels of loose, fine silt. The two highest corners (northeast and southwest) were excavated as partial levels to bring the test unit to level. Control samples were not taken in Layer 1 because of the partial nature of the excavation. Cultural materials recovered from the 1 to 8 cm layer included glass, a button, historic ceramics, bulk bone, and miscellaneous metal. A change to Layer 2 was made as the sediments changed to a very loose and moist silt loam.

Table 9.7. Test Unit 10 artifact summary, 5LA6108, PCMS.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
10	Layer 1	Level 1	0 - 8 cm	1 button 3 miscellaneous metal, 6 glass fragments, 3 bulk bone	None
10	Layer 1	Level 2	0 - 1 cm	2 glass fragments, 3 miscellaneous metal, 1 historic ceramic	1 gastropod sample, 1 macrobotanical sample
10	Layer 2	Level 1	6 - 10 cm	9 glass fragments, 4 bulk bone, 1 nail, 1 miscellaneous metal, 8 historic ceramics	1 button, 1 charcoal sample, 1 shell, 1 unknown sample, 1 macrobotanical sample, 1 gastropod
10	Layer 2	Level 2	9 - 10 cm	5 glass fragments, 2 historic ceramics, 6 bulk bone, 6 miscellaneous metal	4 bulk bone, 1 hair, 1 charcoal sample, 1 macrobotanical sample, 2 gastropod samples
10	Layer 2	Level 3	10 - 13 cm	11 miscellaneous metal, 40 bulk bone, 8 historic ceramics, 1 button, 5 glass fragments, 1 textile sample, 1 feather 1 newspaper sample,	50 miscellaneous metal, 1 textile sample, 43 bulk bone, 1 metal snap, 1 glass fragment, 1 macrobotanical sample, 1 charcoal sample
10	Layer 2	Level 4	0 - 11 cm	2 cartridges, 30 bulk bone, 11 historic ceramic, 2 macrobotanical sample, 1 paper sample, 25 miscellaneous metal, 4 historic ceramics, 4 glass fragments, 1 button,	3 buttons, 2 unknown samples, 1 historic ceramic, 270 bulk bone, 15 cartridges, 8 miscellaneous metal, 1 macrobotanical sample, 1 charcoal sample, 1 glass fragment
10	Layer 2	Level 5	0 - 10 cm	25 miscellaneous metal, 4 bulk bone, 1 paper sample	5 glass fragments, 1 charcoal sample, 15 bulk bone, 2 unknown samples, 1 macrobotanical sample
10	Layer 2	Level 6	0 - 10 cm	1 bulk bone	2 bulk bone, 1 charcoal sample, 2 macrobotanical samples

Layer 2 had prevalent bioturbation with some gravels and charcoal. The layer was excavated in six levels to a thickness of between 28 and 57 cm. Stone slabs found in the layer may be cultural. Midway through the layer, bedrock was exposed at the northern and southern edges of the test unit. The amount of cultural materials collected (decaying wood, metal, bulk bone, and large ash deposits) increased with the depth of the excavations. In Level 5 the charcoal density increased as did the amount of decomposing metal but no *in situ* burning was apparent. The very bottom of Layer 2 was composed mainly of charcoal and ash and contained a small amount of material culture.

After bedrock was reached, it became apparent that attempts had been made in the past to dig deeper into the bedrock. Several macrobotanical samples of unknown origin were collected from Layer 2. Artifacts collected from Layer 2 included glass, metal, historic ceramics, bulk bone, clothing fasteners, possible textiles, newspaper, a feather, and rifle cartridge casings. The largest pieces of charcoal were found near the test unit's bottom. The final excavation levels were impeded as bedrock was encountered at different depths in the test unit, again resulting in excavations of partial levels. In portions of the test unit where excavation was possible, the final depth of the unit reached 57 cm; however, in some areas the depth did not exceed 28 cm.

Eleven samples collected from Test Unit 10 as either macrobotanical or "unknown" were sent to High Plains Macrobotanical Services for further analysis. A complete summary of this analysis is found in Appendix II. These samples separated easily from the sediments of the test unit and held together in clumps up to the size of a fist. An abundance of seeds was visible in most of the samples collected. Analysis of the these specimens "...yielded thousands of unburned strawberry seeds, hundreds of unburned raspberry seeds and 22 complete and unburned grape seeds" (Bach 2004). Also recovered during the macrobotanical analysis were juniper seeds and berries, cholla cactus berries, and six unknown seed species. Other remains included burned eggshell.

Two strata were identified in the east-facing west wall, the south-facing north wall and the west-facing east wall of Test Unit 10. They are described below and illustrated in Figure 9.32.

Stratum I — Stratum I is a 7 to13 cm thick, grayish brown (10YR 5/2), single grained, sandy silt loam. The matrix includes 2% sandstone gravels to pebbles and is disturbed by root growth. Sediments react moderately to hydrochloric acid. The lower boundary is clear and smooth. Historic artifacts were recovered from the stratum.

Stratum II — This stratum is 17 to 48 cm thick. The brown/dark brown (10YR 4/3) silt loam is single-grained to blocky and weakly developed. The lower boundary is very abrupt and irregular. Sandstone pebbles and cobbles increase to 30%. Sediments are disturbed by root growth and react violently to hydrochloric acid. Stratum II ends at bedrock. Cultural material similar to that in Stratum I was collected from this layer.

Given the shallow sediments and the prominent bedrock outcroppings common at the site, the relatively shallow depth of this unit does not preclude its use as a privy. Its use as a privy is supported by the results of the macrobotanical analysis and by the nature and amount of cultural materials recovered throughout the feature fill. If the feature does represent a privy, which results suggest, it was most likely used for a short period of time., or by only a few of the inhabitants (i.e. the women of the house). Privies could have been moved relatively easily and there may be other privies present outside of the site boundary.

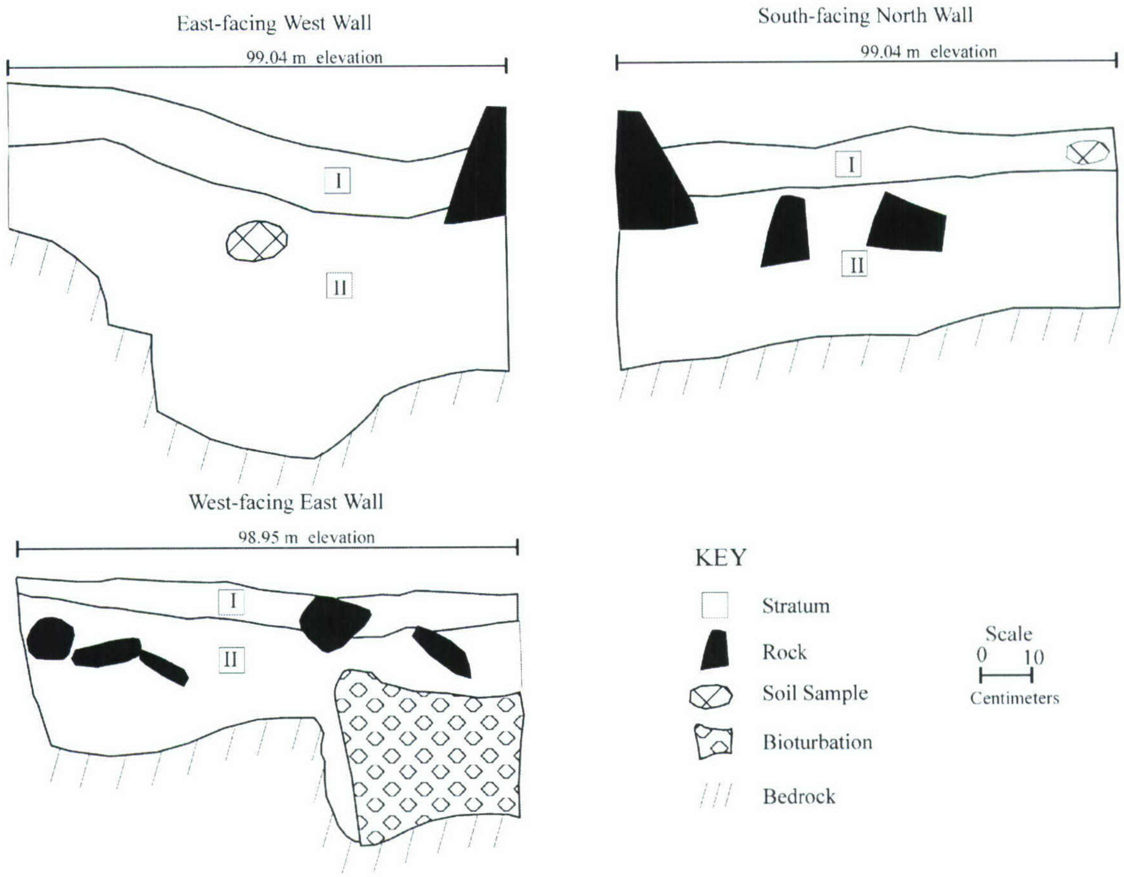


Figure 9.32. West wall profile, north wall profile, and east wall profile , Test Unit 10, 5LA6108.

Test Unit 11

Test Unit 11 was the first of two 1 m x 1 m test units placed inside Feature 7, the double-walled structure. This feature and the possible dugout to the immediate west are situated at least 30 to 40 m to the north of the main site complex. Test Unit 11 was placed very close to the center of the structure (Figure 9.14) with a datum of 157.83mN and 99.10mE at an elevation of 1.53 mbsd or an arbitrary elevation of 98.47 m. The first layer was composed of juniper needles, grasses, seeds, angular cobbles, and a loose sandy loam. A 1 in x 6 in piece of milled wood with seven 1 ¼ in (3d) finishing nails embedded in it was found on the surface but was not collected. No cultural material was collected from this 4 to 6 cm thick duff layer (Table 9.8). After the duff, a change to loose sediments with some compact areas along the eastern edge indicated layer change.

Layer 2 was excavated in three levels reaching a thickness of between 26 and 30 cm. The layer contained roots, pebbles, cobbles, concentrations of calcium carbonate and decaying wood. The sediments became moist, more compact, and blocky with the increased depth of the unit. Three different areas of mottled, compact, red to gray brown and gray sediments were noted in Layer 1. Several areas of looser sediments were likely

affected by bioturbation. What appeared to be a wooden beam was noted in the west wall of the test unit. It was not collected. Cultural material collected from Layer 2 included nails, miscellaneous metal fragments, bulk bone, one possible textile, and charcoal sample. Several large stones near the bottom of Layer 2 may be wall fall. A final layer change was made as the soil became weak and blocky.

Table 9.8. Test Units 11 and 15 artifact summary 5LA6108.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
11	Layer 1	*	4 - 6 cm	None	None
11	Layer 2	Level 1	6 - 11 cm	4 nails, 1 miscellaneous metal, 2 bulk bone	1 miscellaneous metal, 1 macrobotanical sample
11	Layer 2	Level 2	8 - 12 cm	15 nails, 7 bulk bone	15 miscellaneous metal, 1 textile, 1 charcoal sample
11	Layer 2	Level 3	8 - 10 cm	10 nails, 9 bone	1 miscellaneous metal
11	Layer 2	west wall	--	1 bulk bone	None
11	Layer 3	*	6 - 12 cm	None	1 macrobotanical sample
15	Layer 1	Level 1	10 - 11 cm	None	None
15	Layer 1	Level 2	0 - 5 cm	None	None
15	Layer 2	Level 1	10 - 14 cm	10 nails, 1 screw, 1 bulk bone, 2 glass fragments, 1 charcoal sample	1 miscellaneous metal, 1 textile, 3 bulk bone, 1 charcoal sample
15	Layer 2	Level 2	2 - 11 cm	11 miscellaneous metal, 1bulk bone	1 charcoal sample

*Excavated as a single stratigraphic layer

Layer 3 was excavated as a single stratigraphic layer ranging from 6 to 12 cm thick. No cultural material was recovered from this layer. Since it appeared that the culturally sterile deposits of Layer 3 rested below the historic occupation of the site, excavation in Test Unit 11 stopped at a final depth of between 40 and 46 cm.

Four strata were identified in the north-facing south wall and the east-facing west wall profile of Test Unit 11 and are described below (Figure 9.33).

Stratum I — Stratum I is a 6 to 17 cm thick, brown (10YR 5/3), fine-grained sandy loam. The sediments are single grained to granular and weakly developed. A moderate amount of calcium carbonate is present and bioturbation is evident. The matrix is composed of 2% gravels. The lower boundary is clear and smooth to irregular. One piece of milled wood was noted .

Stratum II — Stratum II is a 10 to 20 cm thick, dark brown (10YR 3/3), fine- to medium-grained sandy loam with a single grained to granular, weakly developed

structure. Gravels and pebbles increase slightly to 5%; bioturbation is evident in the layer. The lower boundary is abrupt and smooth. Sediments show a moderate to violent reaction to hydrochloric acid. Cultural material was present in the stratum.

Stratum III — Stratum III is at least 16 to 20 cm thick. This stratum is a layer of dark grayish brown to very dark grayish brown (10YR 4/2 to 10YR 3/2), fine-grained loamy sand with a moderately developed blocky structure. Gravels and pebbles again compose 5% of the matrix. Sediments react slightly to hydrochloric acid. The lower boundary is clear and smooth to irregular.

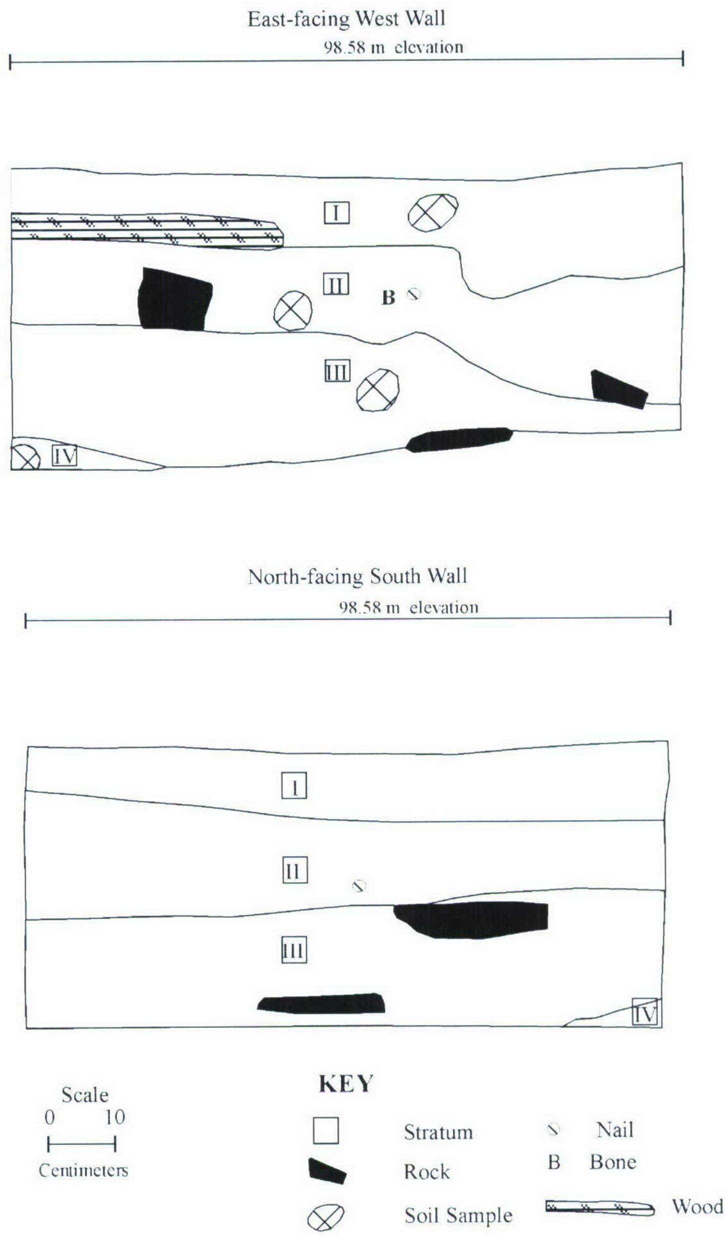


Figure 9.33. West wall profile and south wall profile, Test Unit 11, 5LA6108.

Cultural material was present in the transition from Stratum II to Stratum III.

Stratum IV Stratum IV is a yellowish brown (10YR 5/4), fine-grained sandy loam. The sediments have a granular structure and react violently to hydrochloric acid. Gravels and pebbles compose 2 % of the matrix. The lower boundary of Stratum IV was concealed. No cultural material was found in this layer.

<u>Test Unit 15</u>

Test Unit 15 was positioned immediately south of Test Unit 11 just inside the doorway of the double-walled structure (Figure 9.14) in an attempt to locate the door stoop and to investigate this area. The test unit datum was the same as that used in Test Unit 11. The control unit was placed in the northeast corner; however, a control sample was not collected in Layer 1 because of the slope of the ground surface.

Layer 1 was excavated in two levels (Table 9.8). This topsoil was a 5 to 14 cm thick overburden layer consisting of single-grained sandy sediments with grass and some bioturbation. One piece of milled wood, similar to that found at the surface of Test Unit 11, was noted but not collected. No other artifacts were found in the layer. A stratigraphic change was made when the sediments became more rust-colored with areas of gray ashy deposits. Wood, that may have been roof fall, was noted but not collected.

Layer 2 contained a high percentage of decomposing wood. Excavated in two levels, Layer 2 ranged from between 16 and 21 cm thick. The sediments were primarily decomposing construction materials. The eastern half of the first level exposed a gray deposit that appeared to contain some ash and calcium carbonate. This may be the remains of wall plaster or masonry mortar. Sandstone inclusions increased in size from small cobbles to large rocks with the increased depth of the layer. The rocks rested on a layer similar to that revealed in Test Unit 11, Layer 3. Because this layer was culturally sterile in Test Unit 11, excavations in Test Unit 15 were terminated at contact with Layer 3. Nails, a screw, miscellaneous metal, glass, bulk bone, and charcoal were collected from Layer 2. Test Unit 15 reached a final depth of between 25 –35 cm below ground surface.

Two strata were identified in the west-facing east wall of Test Unit 15; three were identified in the east facing west wall. These are described below (Figure 9.34).

Stratum I Stratum I is a 6 to 8 cm thick layer of brown/dark brown (10YR 4/3), single-grained, silty clay loam. Poorly sorted, subangular pebbles make up 60% of the layer. Bioturbation and a moderate amount of calcium carbonate are also present. The lower boundary is clear and smooth. Milled wood was noted but not collected from this stratum.

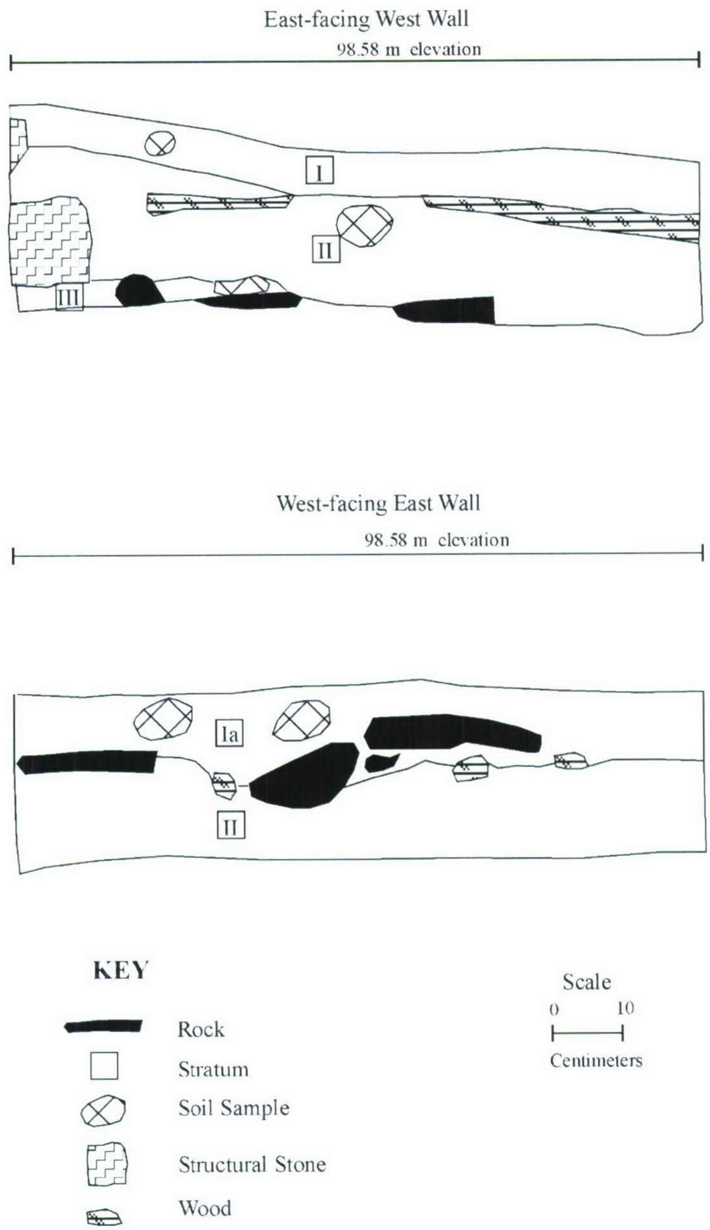


Figure 9.34. West wall profile and east wall profile, Test Unit 15, 5LA6108.

Stratum Ia — This stratum is found only in the east wall. The layer of gray (10YR 6/1 to 10YR 5/1), single grained to granular, silty clay loam ranges in thickness from between 8 and 13 cm. Pebbles and cobbles (10%), bioturbation and a high percentage of calcium carbonate are also found in the layer. The lower boundary is clear and smooth. Cultural material was collected from Stratum Ia.

Stratum II — This layer of dark brown (10YR 3/3), fine- to medium-grained, sandy loam is at least 13 to 20 cm thick. The sediment structure is single grained to granular and weakly developed. Bioturbation, granules, pebbles, cobbles, and a high concentration of decomposing wood are present in the layer. Sediments react moderately to violently to hydrochloric acid. Although the lower boundary is partially concealed, the portion that is visible is abrupt and smooth. Cultural material was recovered from this layer.

Stratum III — Stratum III is exposed only in the lower southern corner of the test unit wall. The dark gray brown to very dark gray brown (10YR 4/2 - 3/2), sandy clay loam has an angular to blocky, moderately developed structure. Forty percent of the layer consists of pebbles and cobbles. Sediments react very slightly to hydrochloric acid. The lower boundary of Stratum III was concealed. No cultural material was recovered from the stratum.

Although artifacts were collected from Test Units 11 and 15 they may be related primarily to the roof of the structure and any shelving that might have been present inside. There was no evidence that Feature 7 served as a domicile. The elaborate construction does suggest that structure was used either for cold or dry storage.

Test Unit 12

Four extramural 1 m x 1 m test units were excavated to investigate the northern extent of subsurface cultural deposits at the site. Test Unit 12 was placed near the northern limit of the main site complex and was excavated in two layers. The test unit datum was placed on the northeast corner of the unit at 157.39mN 69.02mE at an elevation of 1.44 mbsd or an arbitrary elevation 98.56 m.

Layer 1 was a 3 to 6 cm thick sod layer of light brown, loose sediments containing a high percentage of roots. No cultural material was recovered from this layer (Table 9.9). Layer 2 was excavated in two levels and ranged in thickness from between 19 and 20 cm. The sediments were darker brown and moist and included 5 to 10% gravels. Disturbance from root growth continued from the above layer. No cultural materials were recovered from Layer 2. Excavations were terminated at a final depth from between 22 and 26 cm.

Two strata were observed in the south-facing north wall and the west-facing east wall of Test Unit 12 (Figure 9.35).

Table 9.9. Test Units 12, 13, 16, and 19 artifact summary, 5LA6108.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
12	Layer 1	*	3 - 6 cm	None	1 gastropod sample
12	Layer 2	Level 1	9 - 10 cm	None	None
12	Layer 2	Level 2	10 cm	None	None
13	Layer 1	*	3 - 6 cm	1 glass fragment	No control sample collected
13	Layer 2	Level 1	7 - 10 cm	None	1 flaked lithic artifact
13	Layer 2	Level 2	9-10 cm	None	None
13	Layer 2	Level 3	6 - 8 cm	None	None
16	Layer 1	*	1 - 6 cm		1 miscellaneous metal fragment, 1 bulk bone, 1 macrobotanical sample, 2 gastropod samples
16	Layer 2	Level 1	3 - 10 cm	None	1 macrobotanical sample
16	Layer 2	Level 2	10 - 11 cm	None	1 macrobotanical sample
16	Layer 3	Level 1	6 - 10 cm	None	1 macrobotanical sample
19	Layer 1	*	1 - 3 cm	None	None
19	Layer 2	*	6 - 10 cm	None	None
19	Layer 3	Level 1	10 cm	None	None
19	Layer 3	Level 2	9 - 10 cm	None	None

*Excavated as a single stratigraphic layer

Test Unit 13

This 1 m x 1 m test unit was situated at the northern end of the site in an open area approximately 20 to 30 m southwest of Test Unit 12. The datum for Test Unit 13 was placed at 135.37mN, 53.07mE, at an elevation of 1.37 mbsd or an arbitrary elevation of 98.63 m. The unit was excavated in two stratigraphic layers.

Layer 1 was a 3 to 6 cm thick layer of sandy loam. One glass fragment was found at the surface (Table 9.9). A change to a second layer was made as sediments became more moderately developed and gravels increased. Layer 2 was excavated in three levels, reaching a thickness of between 23 and 27 cm. One flake was recovered from the processed control sample within the first 10 cm of Layer 2. No other cultural material was recovered from Layer 2. Excavations were terminated at a final depth from between 27 and 31 cm when shale was exposed.

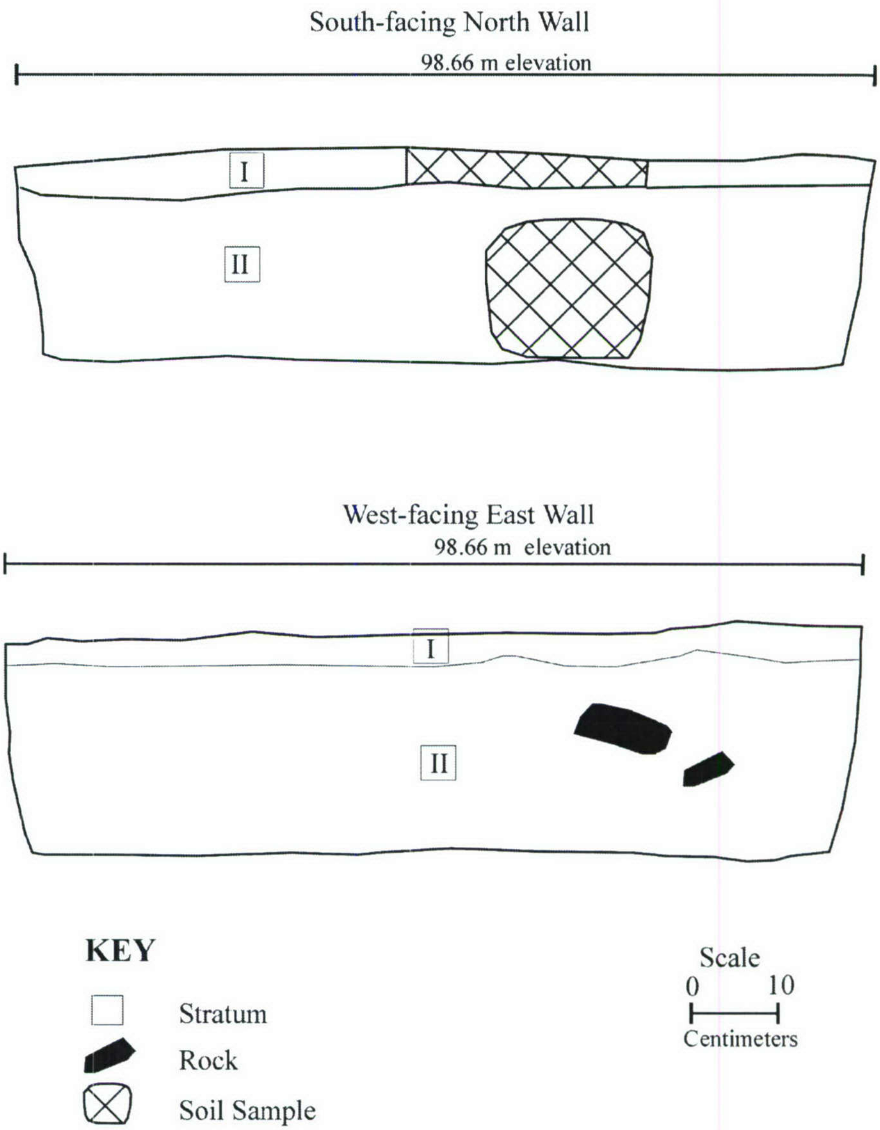


Figure 9.35. North wall profile and east wall profile, Test Unit 12, 5LA6108.

Three strata were identified in the south-facing north wall and the west-facing east wall of Test Unit 13. They are described below (Figure 9.36).

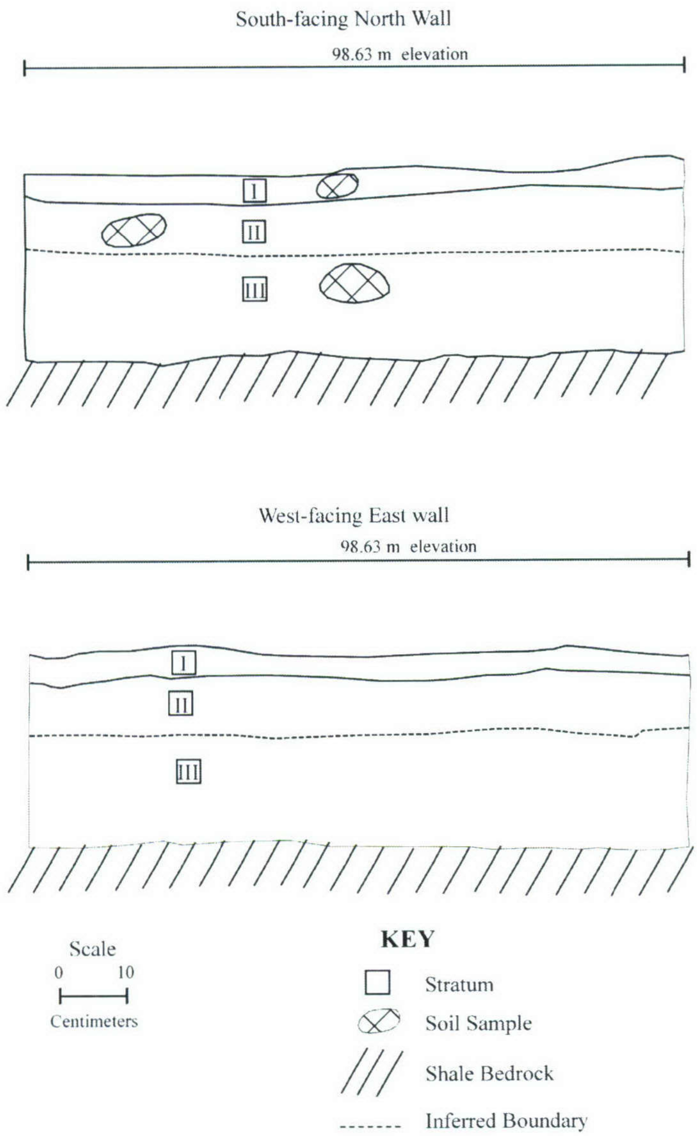


Figure 9.36. North wall profile and east wall profile, Test Unit 13, 5LA6108.

Stratum I — Stratum I is 2 to 5 cm thick, brown to pale brown (10YR 6/3 - 10YR 5/3), single grained, and weakly developed sandy loam. Angular, poorly sorted pebbles and cobbles compose 5% of the matrix. There is a moderate amount of calcium carbonate present. The layer is bioturbated by root growth; the lower boundary is clear and smooth. One glass fragment was collected from the surface of the test unit.

Stratum II Stratum II is an 8 to 10 cm, brown to dark brown (10YR 5/3 - 10YR 3/3), weak to moderately developed, blocky, sandy loam. The sediments include 10% poorly sorted, angular pebbles and cobbles. Sediments react violently to hydrochloric acid. Bioturbation from root growth continues from Stratum I. The lower boundary is gradual and smooth. One flake was recovered from Stratum II.

Stratum III Stratum III is a 16 to 17 cm thick, yellowish brown (10YR 5/4), sandy loam. The sediments are moderately developed and blocky. The lower boundary remained concealed. Angular, poorly sorted pebbles and cobbles increase to 15% of the sediments. A high percentage of calcium carbonate is present. Bioturbation continues from above. No cultural material was recovered from this stratum.

Test Unit 16 This 1 m x 1 m test unit was placed to the northeast of the main site complex. The datum for Test Unit 16 was placed at 144.52mN, 123.26mE, at an elevation of 2.68 mbsd or an arbitrary elevation of 97.32 m. The unit was excavated in three stratigraphic layers to a final depth of between 21 and 32 cm.

Layer 1 was excavated as a single stratigraphic layer, 1 to 6 cm thick. This overburden layer consisted primarily of duff and some loose, silty sediments. Although metal can fragments were observed on the ground surface in the area surrounding the test unit, only one piece of miscellaneous metal and one bulk bone were recovered from Layer 1 (Table 9.9).

Layer 2 was excavated in two levels and reached a thickness of between 14 and 20 cm. The sediments were a silty loam containing 35 to 40% sandstone gravels. A layer change was indicated as the sediments became more grayish brown and had a high concentration of shale. No cultural material was recovered from Layer 2.

After the excavation of the 6 to 10 cm thick Layer 3, excavations in Test Unit 16 were terminated. No cultural materials were recovered from Layer 3.

Three strata were identified in the south-facing north wall and the east-facing west wall of Test Unit 16 (Figure 9.37).

Stratum I Stratum I consists mainly of duff and roots from a nearby juniper tree. The remaining sediments from this 2 to 5 cm thick stratum are a brown to yellowish brown (10YR 5/3 - 10YR 5/4), single grained, sandy loam. Less than 1% of the matrix is composed of sandstone gravels. No calcium carbonate is present. The lower boundary is abrupt and smooth. A small amount of cultural material was recovered from this stratum.

Stratum II Stratum is a 4 - 12 cm thick, dark brown/brown (10YR 4/3), clay loam. The sediments are moderately developed and blocky; no calcium carbonate

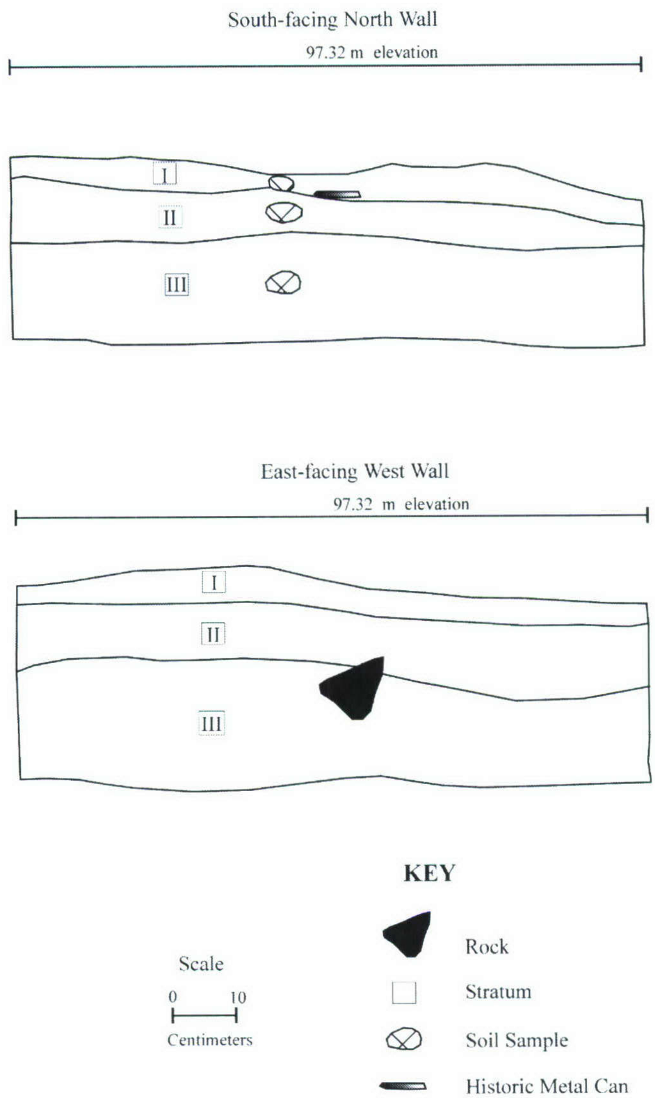


Figure 9.37. North wall profile and west wall profile, Test Unit 16, 5LA6108.

is present. Sandstone gravels and cobbles increase to 30 to 40% of the matrix. The lower boundary is clear and smooth. No cultural materials were collected from Stratum II.

Stratum III This 13 to 20 cm, light gray (10YR 7/1), sandy loam is well developed and blocky. Pebbles increase to greater than 50% and sediments react violently to hydrochloric acid. The lower boundary remained concealed. Stratum III contained no cultural material.

Test Unit 19

This was the fourth 1 m x 1 m test unit to examine the northern extent of subsurface cultural deposits at the site. The unit was positioned east of the main site complex. Test Unit 19 was excavated in three stratigraphic layers reaching a final depth of between 27 and 33 cm. The unit datum was placed at the northwest corner of the unit at 129.39mN, 148.05mE, at an elevation of 2.82 mbsd or an arbitrary elevation of 97.18 m.

Layer 1 was a 1 to 3 cm thick sod layer containing loose, granular sediments. A layer change was indicated by the reduction of sod and the increase in sandstone pebbles and cobbles. Layer 2 was also excavated as a single stratigraphic layer and ranged in thickness from 6 to 10 cm. Sandstone pebbles and cobbles increased in this layer. A final layer change was made as sediments became more orange. Sandstone and shale gravels increased in size. Layer 3 was 19 to 20 cm thick. After completing two culturally sterile levels, excavation of Test Unit 19 was terminated. The test unit reached a final depth of between 27 and 33 cm. Although the unit was placed in the midst of a light historic metal scatter, no cultural material was recovered from any of the three layers (Table 9.9).

Four strata were identified in the south-facing north wall and east-facing west wall of Test Unit 19. These are described below (Figure 9.38).

Stratum I — Stratum I is a 3 to 6 cm thick brown (10YR 5/3) loam to clay loam with a single grained, weakly developed structure. Five percent of the matrix is composed of granule- to pebble-sized rocks. Bioturbation is evident in the layer; no calcium carbonate is present. The lower boundary is clear and smooth. No cultural material was collected from this stratum.

Stratum II — Stratum II is a brown to pale brown (10YR 5/3 - 6/3), silty clay loam ranging in thickness from 3 to 9 cm. The sediments are moderately developed and blocky and react violently to hydrochloric acid. The layer is composed of 5 to 10% pebbles and cobbles. The lower boundary is clear and smooth. No cultural material was recovered.

Stratum III — Stratum III ranges from 8 cm to greater than 24 cm thick. The pale brown (10YR 6/3), silt loam has blocky and rounded, moderate- to well-developed peds. Pebbles and cobbles make up 5 to 10% of the matrix. A high percentage of calcium carbonate is present. The lower boundary is partially concealed. Where exposed, the lower boundary is abrupt and irregular. Stratum III produced no cultural material.

Stratum IV — Stratum IV matrix consists of 90% sandstone and shale pebbles and cobbles. The remaining sediments are a pale brown to very pale brown (10YR6/3 - 10YR6/3), sandy clay loam. The peds are both blocky and rounded and moderate to well developed. A high percentage of calcium carbonate is also present. The lower boundary was concealed. No cultural material was recovered from this layer.

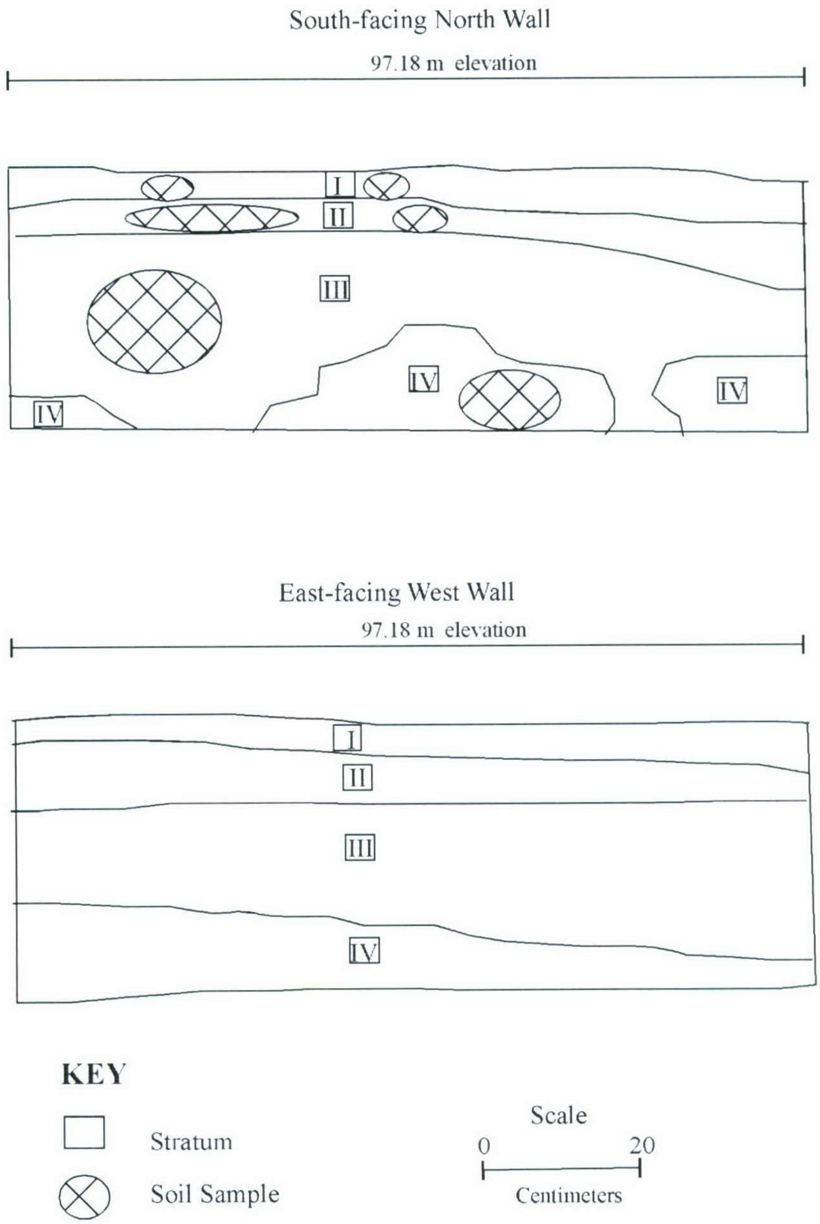


Figure 9.38. North wall profile and west wall profile, Test Unit 19, 5LA6108.

In all, four units were excavated to test for subsurface cultural deposits north and east of the main site complex. These test units produced no evidence for intact cultural deposits in these areas.

Test Unit 14

Test Unit 14 began as a 1 m x 2 m test unit placed in the large depression presumed to be a dugout (Feature 4). This feature is located east of the domicile (Feature 2). Control samples were removed from the northwest and northeast corners of the test unit (Table 9.10). The datum was placed at 112.75mN, 105.09mE, at an elevation of 0.36 mbsd or an arbitrary elevation of 99.64 m. The test unit was excavated in three stratigraphic layers to a final depth of 138 cm bgs.

Table 9.10. Test Unit 14 artifact summary, 5LA6108.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
14	Layer 1	Level 1	0 - 10 cm	None	1 macrobotanical sample, 1 shell (No sample collected from NE corner)
14	Layer 1	Level 2	9 - 10 cm	2 miscellaneous metal	2 glass fragments, 1 macrobotanical sample, 2 gastropod samples, 1 shell
14	Layer 1	Level 3	10 cm	None	1 glass fragment, 1 charcoal sample, 2 macrobotanical samples, 1 shell
14	W ½ Layer 1	Level 4	10 cm	2 rubber pieces	3 glass fragments
14	W ½ Layer 1	Level 5	10 cm	None	7 glass fragments, 1 miscellaneous metal, 1 charcoal sample, 1 shell
14	W ½ Layer 1	Level 6	18 - 22 cm	1 miscellaneous metal	2 glass fragments
14	W ½ Layer 2	Level 1	18 - 20 cm	3 miscellaneous metal, 1 flaked lithic artifact	1 charcoal sample
14	W ½ Layer 2	Level 2	18 - 20 cm	None	None
14	W ½ Layer 2	Level 3	0 - 9 cm	1 metal can	2 miscellaneous metal, 2 macrobotanical samples
14	W ½ Layer 3	Level 1	1 - 10 cm	None	None
14	W ½ Layer 3	Level 2	10 cm	None	None

Layer 1 was excavated in six levels reaching a depth of between 66 and 68 cm below the ground surface. The sediments were compact, light-to medium-brown clay with few artifacts. Because of the high soil compaction and the scarcity of artifacts, excavations were limited to the west half (1 m x 1 m) of the test unit beginning with Layer 1, Level 4. Layer 1, Level 6 was excavated as a 20 cm level to expedite excavation. Glass, miscellaneous metal fragments, rubber pieces, and charcoal samples were collected from the layer (Table 9.10). A layer change was made when more shale and at least 5% sandstone gravels were encountered.

Layer 2 was dug in two 20 cm levels and one partial level to a thickness of between 36 and 47 cm. Sediments ranged from an outcrop of shale in the southeast corner, to softer, sandy soils in the southwest corner and harder clay sediments in the northern portion of the unit. The shale became more exposed as the excavations went deeper. Because of the dipping stratigraphy, only the northern portion of the test unit was excavated in the last two levels of Layer 2. All fill from Levels 2 and 3 were collected as control samples. Several pieces of wood, possibly associated with the construction of the dugout, were observed in Layer 2 but were not collected. Collected artifacts include miscellaneous metal, one metal can, and one flaked lithic artifact.

Layer 3 was largely composed of decomposing shale. No artifacts were collected. Additional wood was noted but it was indeterminate whether it was cultural or not. After completing excavation of the 11 to 20 cm Layer 3, two auger test probes were undertaken in the floor of the test unit. The two auger probes placed at the bottom of Layer 3 reached a depth of 43 cm and 33 cm respectively, before reaching bedrock. The culturally sterile sediments showed no change from those identified as Stratum VII in the test unit.

Eight strata were identified Test Unit 14. Six were recorded in the east-facing west wall, seven in the north-facing south wall, and four in the south-facing north wall (Figures 9.39 and 9.40).

Stratum I — Stratum I is a thick (57 to 120 cm) layer of light grayish brown (10YR 6/2), sandy loam. The pedogenic structure is angular to blocky and well developed. Sandstone pebbles (0 to 2%), bioturbation, and a small amount of calcium carbonate are present in the layer. The lower boundary is clear and wavy. A small amount of cultural material was collected from this stratum.

Stratum II — Stratum II appears only within Stratum I in the south and west walls. The stratum is a 2 to 12 cm thick layer of light grayish brown (10YR 6/2), coarse sandy loam with a subangular and blocky, moderately developed structure. Sandstone pebbles (0 to 2%) and roots occur in the layer. The sediments react violently to hydrochloric acid. The lower boundary is abrupt and smooth.

Stratum III — Stratum III is a 1 to 15 cm layer of light grayish brown (10YR 6/2), course. Sandy loam. The pedogenic structure is subangular, blocky and single

grained to moderately well developed. Sandstone pebbles increase to between 5 and 10%. Stratum III is exposed both as an isolated lens and on top of Stratum VII. The lower boundary is abrupt and smooth. Roots and a high concentration of calcium carbonate are also present in the stratum.

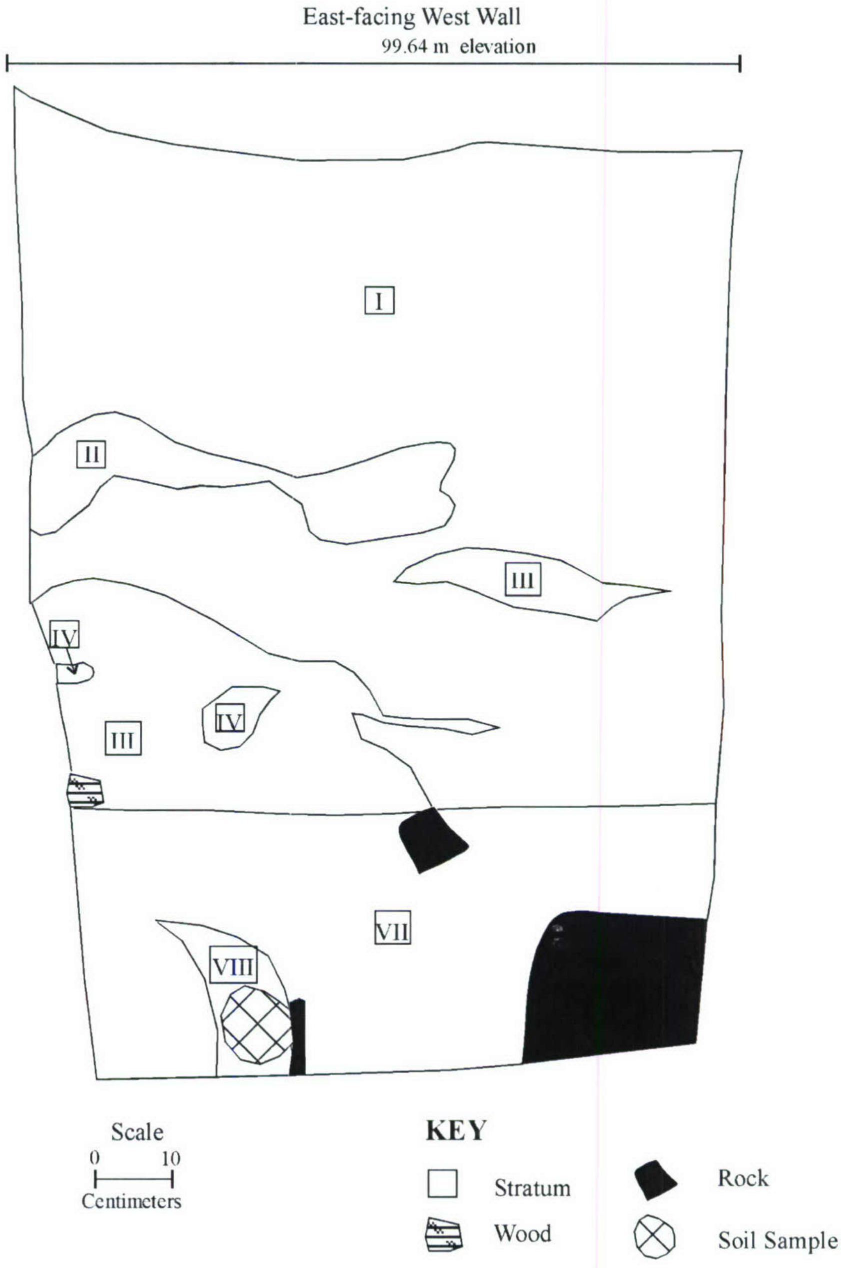


Figure 9.39. West wall profile, Test Unit 14, 5LA6108.

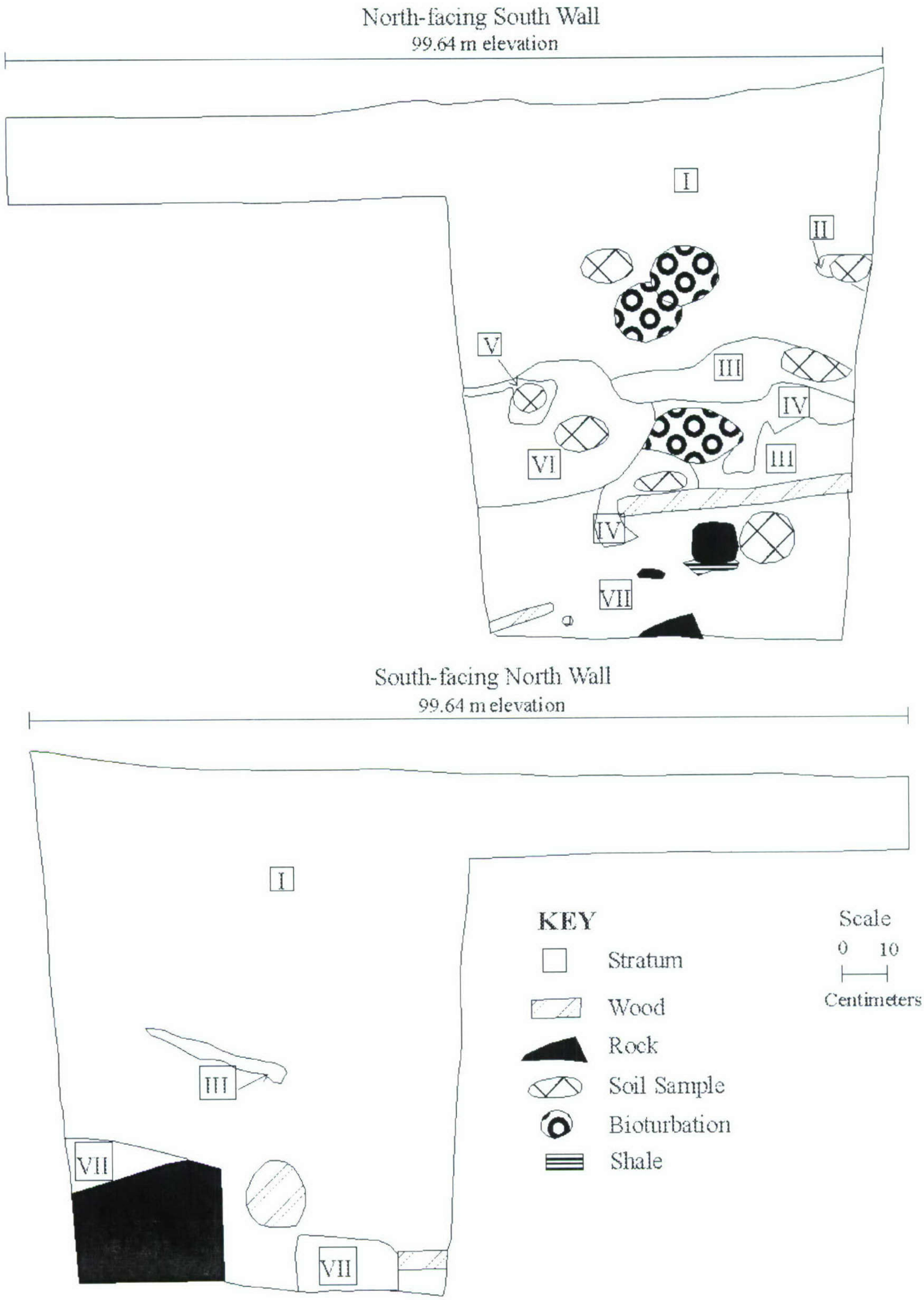


Figure 9.40. South wall profile and north wall profile, Test Unit 14, 5LA6108.

Stratum IV	Stratum IV is a 1 to 22 cm thick, light grayish brown (10YR 6/2) loam. The subangular and blocky, well developed sediments react violently to the hydrochloric acid. Sandstone pebbles make up between 0 and 2% of the layer. The lower boundary is abrupt and smooth.
Stratum V	This stratum is 1 to 10 cm thick. It is composed primarily of isolated pockets of shale. Bioturbation is present in the stratum. No calcium carbonate is present. The lower boundary is very abrupt and smooth. This stratum is present only in the south wall.
Stratum VI	This white (10YR 8/1), blocky and moderate- to well-developed layer of sandy clay loam ranges in thickness from 4 to 33 cm. Shale pebbles make up 7% of the stratum, which is apparent only in the south and east wall. Sediments react very violently to hydrochloric acid. The lower boundary is very abrupt and smooth.
Stratum VII	Stratum VII is visible in all walls but found predominately in the profile of the west wall. It is a thick, brown (10YR 5/3), coarse sandy clay loam with a single grained to blocky, and a weak- to moderately-developed structure. The matrix consists of 45% shale and sandstone pebbles and cobbles. The sediments react violently to hydrochloric acid. The lower boundary of Stratum VII remained concealed.
Stratum VIII	Stratum VIII consists of a 1 to 19 cm thick pocket of dark gray shale exposed in the west wall. The lower boundary remained concealed.

The irregular stratigraphy in the lower strata is the result of differing fill sequences, wall slump, and water ponding. This irregularity makes it difficult to determine which strata contained cultural material. The small number of artifacts collected include both historic artifacts and a prehistoric flake. Although artifacts were scarce, the steel sanitary can found near the bottom of the unit, the decayed wood observed but not collected, and the proximity to Feature 2 suggest that this feature represents the remains of a dugout.

Test Unit 17

The domicile foundation (Feature 2) was investigated through the excavation of three test units. The first, Test Unit 17, was a 2 m x 2 m unit placed in the southeast corner. It was situated so that a portion of the test unit was outside of the structure foundation to capture the intersection of the walls and to allow for a comparison of profiles and artifacts from inside and outside the structure. Sediments from inside and outside the foundation were screened separately and artifacts were given separate field specimen numbers. Control units were placed in each corner of the 2 m x 2 m unit. The unit datum was placed at 105.32mN, 97.78mE, at an elevation of .29 masd for an arbitrary elevation of 100.29 m. Test Unit 17 was excavated in two stratigraphic layers to a final depth of between 18 and 25 cm bgs.

Layer 1 consisted mainly of cholla, prickly pear cactus, and grasses in a matrix of gray, single-grained, very loosely structured overburden. Layer 1 was excavated as a single stratigraphic layer and was 1 to 6 cm thick. Metal, glass, historic ceramics, a button, a snap, and a sparkplug were recovered from Layer 1 (Table 9.11). These came primarily from inside the foundation. A layer change was made when the sediments became more brown and more moderately structured and when the percentage of gravels, especially pebbles, increased. Outside of the foundation the gray-colored sediments were loosely structured and contained a high percentage of broken shale.

Table 9.11. Test Units 17, 23, and 24 artifact summary, 5LA6108.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
17	Layer 1	✳	1 - 6 cm	Inside: 10 glass fragments, 1 button, 1 historic ceramic, 1 snap, 22 miscellaneous metal Outside: 1 glass fragment, 1 miscellaneous metal	4 glass fragments, 1 sparkplug, 2 miscellaneous metal, 1 gastropod sample, 1 macrobotanical sample
17	Layer 2	Level 1	6 - 10 cm	Inside: 7 miscellaneous metal, 2 glass fragments Outside: 1 glass fragment	3 miscellaneous metal
17	Layer 2	Level 2	9 - 11 cm	None	1 glass fragment, 1 miscellaneous metal, 1 charcoal sample
23	surface	--	--	2 miscellaneous metal, 9 glass fragments	--
23	Layer 1	✳	4 - 6 cm	28 bulk bone, 78 glass fragments, 32 miscellaneous metal, 1 flaked lithic artifact	20 glass fragments, 3 bulk bone, 10 miscellaneous metal, 2 snaps, 1 flaked lithic artifact, 1 charcoal sample
23	Layer 2	✳	1 - 3 cm	28 glass fragments, 11 miscellaneous metal, 24 bulk bone, 1 organic material	54 bulk bone, 2 miscellaneous metal, 8 glass fragments, 1 gastropod sample
24	surface	--	--	21 glass fragments, 2 miscellaneous metal	--
24	Layer 1	✳	2 - 3 cm	13 miscellaneous metal, 1 historic ceramic, 109 glass fragments, 2 flaked lithic artifacts	1 miscellaneous metal, 3 historic ceramics, 18 glass fragments,1 charcoal sample, 1 macrobotanical sample, 1 calcite sample
24	Layer 2	✳	2 - 5 cm	78 glass fragments, 25 miscellaneous metal, 2 flaked lithic artifacts	17 glass fragments, 6 miscellaneous metal, 3 historic ceramics, 1 macrobotanical sample

✳Excavated as a single stratigraphic layer

Layer 2 was excavated in two levels. The structure's walls appear to originate within Layer 2. It is believed that the floor of the structure was reached in the first 6 to 10 cm of this layer. In the lower 9 to 11 cm of the layer, the sediments were much more compact with larger peds. No color change was noted; however, only a small amount of cultural material was collected from the lower level of Layer 2, and they were recovered only after the control samples were processed. Artifacts collected from Layer 2 include metal, glass, and a small amount of charcoal. Excavations were terminated after this lower level proved to be largely void of cultural material. Layer 2 was between 16 and 20 cm thick.

Three strata were identified in the profile of the east-facing west wall; four were identified in the north-facing south wall of Test Unit 17. They are described below (Figure 9.41).

Stratum I — Stratum I is a 2 to 8 cm, pinkish gray (7.5YR 6/2), single grained, sandy clay. Roots and gravels (20%) are found in the layer. Sediments react slightly to hydrochloric acid. The lower boundary is clear and irregular. Cultural material was recovered from Stratum I.

Stratum II — Stratum II is a thin (1 to 7 cm) layer of brown to dark brown (7.5YR 4/2), single grained, clay loam. Gravels decrease to 5%. Root growth continues from above. Sediments react violently to hydrochloric acid. Stratum II was exposed only in the interior of the feature. The lower boundary is clear and irregular. Cultural material was present in this stratum.

Stratum III — Stratum III is a dark brown (7.5YR 3/2) clay ranging in thickness from 1 to 20 cm. Peds are blocky; gravel is less than 5%. The percentage of calcium carbonates remains high. Bioturbation is evident in the layer. The lower boundary is gradual and wavy where exposed. Cultural material was also present in this stratum.

Stratum IV — Stratum IV is a thick, pinkish gray (7.5YR 6/2), sandy clay with blocky peds. Bioturbation is again evident in the layer and gravels remain less than 5%. Sediments react violently to hydrochloric acid. The lower boundary remained concealed. A minimal amount of cultural material was recovered from the control sample only.

Test Unit 23

Test Unit 23 was a 1 m x 1 m test unit placed in the northeast corner of Feature 2 (Figure 9.7). The north wall of this test unit was parallel to the north wall of the feature. The test unit datum was placed at 114.39mN, 97.23mE, at an elevation of 0.08 masd or an arbitrary elevation of 100.08. Before excavation began on Test Unit 23, metal and glass fragments visible on the surface were collected. Sandstone blocks observed on the surface were likely once part of the structure's foundation.

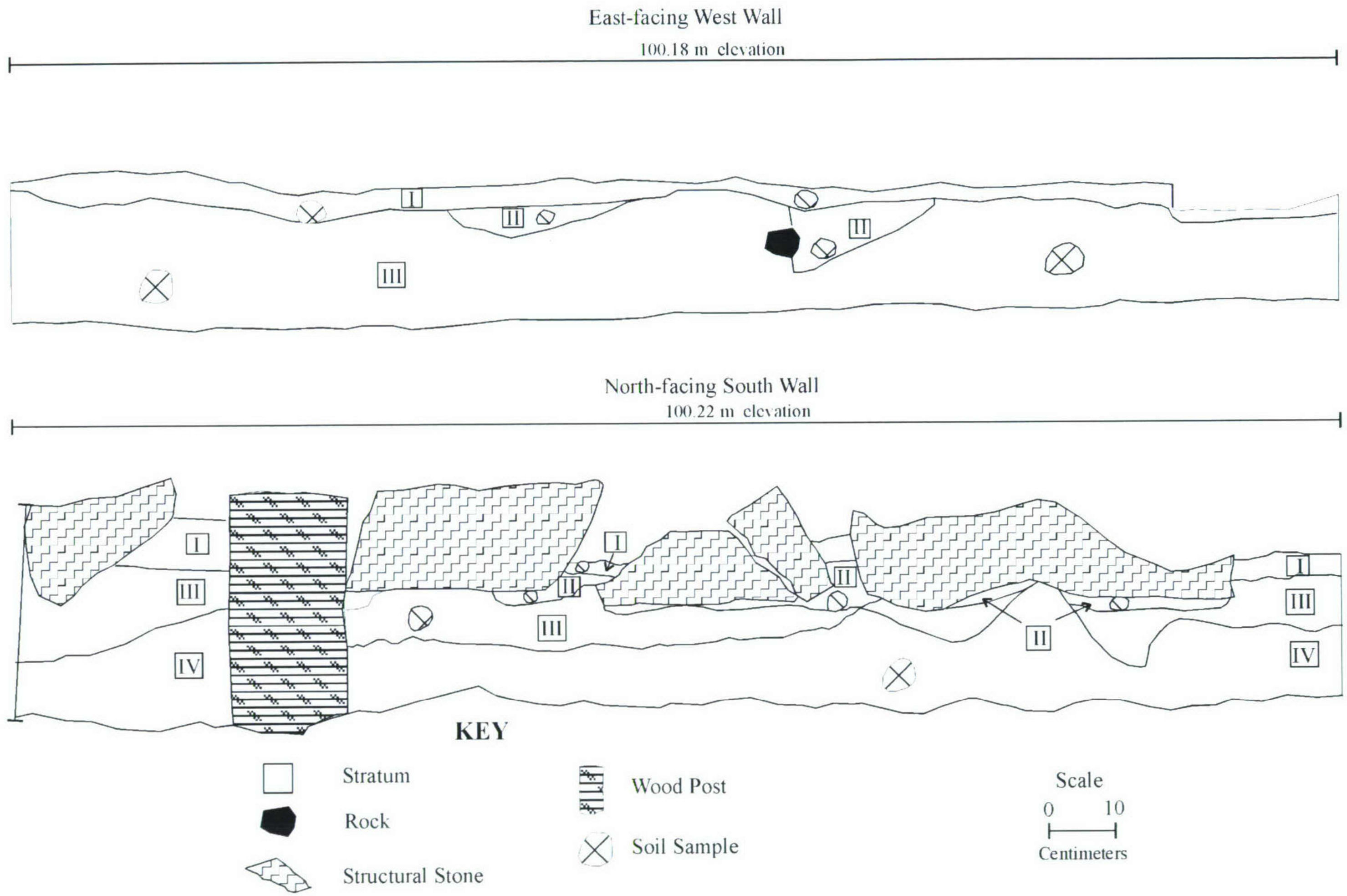


Figure 9.41. West wall profile and south wall profile, Test Unit 17, 5LA6108.

The first layer consisted of sediments containing sandstone blocks and vegetation-mainly prickly pear and short grasses. The total thickness for Layer 1 was between 4 and 6 cm. Glass, miscellaneous metal, bulk bone, and lithic debitage were collected (Table 9.11). A layer change was made as a light to dark-gray stain containing a high concentration of charcoal, burned wood, burned bone, and other artifacts was revealed in the southwestern portion of the test unit.

The remaining sediments in Layer 2 contained disintegrating sandstone gravels. Near the north wall a light gray, platy material, possibly masonry mortar, was also noted. Layer 2 was 1 to 3 cm thick. At the appearance of a more hard-packed surface, possibly the feature floor, work on Test Unit 23 was terminated. Excavations completed in Test Unit 17 showed that deposits below this level were culturally sterile; the final depth of this test unit ranged from between 3 and 9 cm bgs.

Two strata were observed in the east-facing west wall and the south-facing north wall profiles of Test Unit 23. These are described below (Figure 9.42).

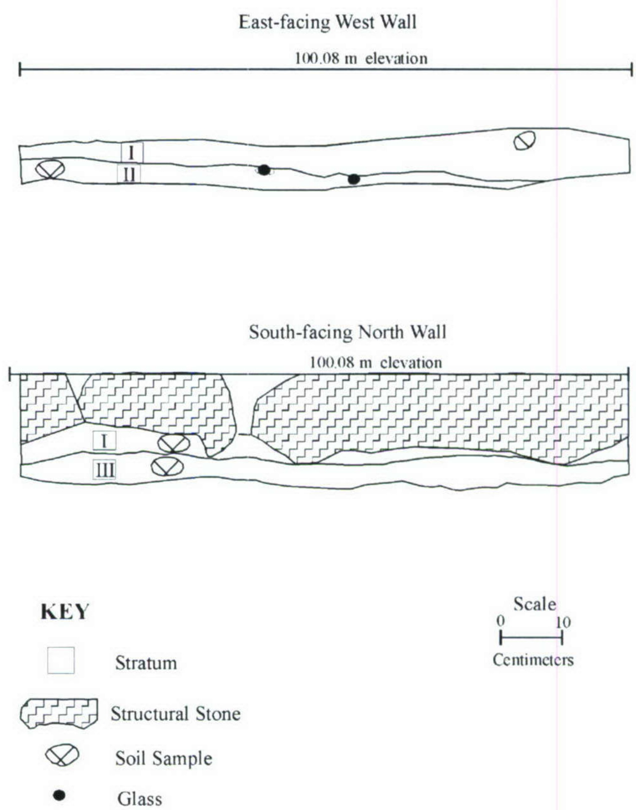


Figure 9.42. West wall profile and north wall profile, Test Unit 23, 5LA6108.

Stratum I — Stratum I is a 1 to 10 cm thick, single grained, pinkish gray, sandy loam. Poorly sorted angular gravels (0 to 5%) and bioturbation are present in the layer. The sediments react moderately to hydrochloric acid. The lower boundary is gradual and smooth. Cultural material was collected from this stratum.

Stratum II — This stratum is a thin (1 to 4 cm) layer of grayish brown (10YR 5/2), single grained, clay loam. Gravels again make up 0 to 5% of the matrix and bioturbation is present. The sediments react only slightly to hydrochloric acid. The lower boundary is gradual and smooth. Stratum II was identified only in the east-facing west wall. This layer contained cultural material.

Stratum III — Stratum III is 2 to 5 cm thick. The gray (5YR 6/1), clay loam has a platy pedogenic structure. Gravels increase to 15 to 20%. A small percentage of calcium carbonate is present. The lower boundary is concealed. Stratum III was recorded in the south-facing north wall only. Cultural material was recovered from this stratum.

Test Unit 24

Test Unit 24 was the final test unit excavated in Feature 2 and was situated parallel to the north wall in the northwestern corner (Figure 9.7). The datum was placed at the northwest corner of the unit at 114.50mN, 94.21mE, at an elevation of 0.06 masd or an arbitrary elevation of 100.05 m. Artifacts visible at the surface (glass and metal) were collected (Table 9.11). Two layers were excavated in Test Unit 24 to a final depth from between 5 and 7 cm bgs.

The topsoil layer, Layer 1, was a medium brown light silt with very little structure but held together by some grass roots. This layer was 2 - 3 cm thick and contained a large concentration of glass as well as metal, historic ceramics, and flaked lithic artifacts.

Layer 2 was a 2 to 5 cm thick, moderately compact layer of light brown sediments. Some charcoal and burned rocks were noted in this layer. Glass, metal, historic ceramics, and flaked lithic artifacts were collected from the layer. Excavations were terminated when very compacted sediments, designated as the floor of Feature 2, were encountered.

Two strata were recorded in the east-facing west wall and the south-facing north wall of Test Unit 24 (Figure 9.43).

Stratum I — Stratum I is a thin, 1 to 5 cm thick, weakly developed, light brownish gray (10YR 6/2), single grained loam. Sandstone pebbles (2%) and root growth are evident in the layer; no calcium carbonate is present. The lower boundary is abrupt and smooth. Cultural material was recovered from this layer.

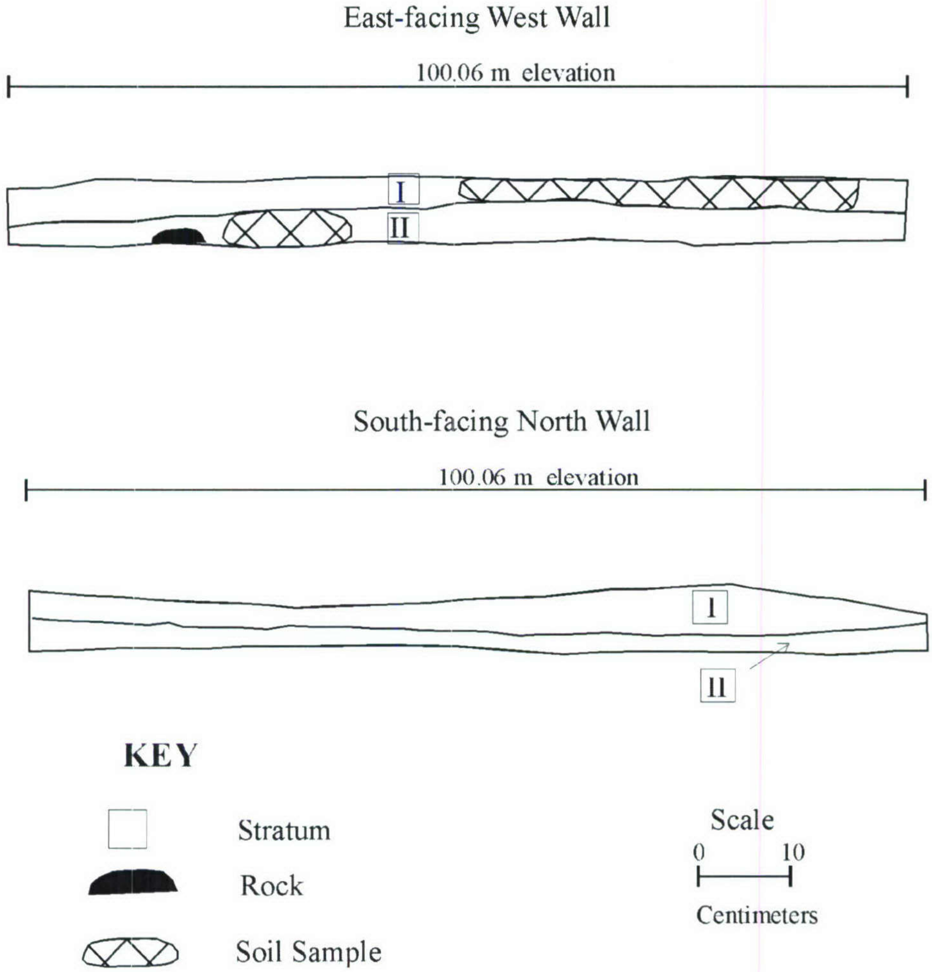


Figure 9.43. West wall profile and north wall profile, Test Unit 24, 5LA6108.

Stratum II — Stratum II is a light gray (10YR 7/2), moderately developed, sandy loam with blocky peds. Sandstone pebbles increase to between 15 and 20%. Sediments react slightly to hydrochloric acid. The lower boundary of Stratum II remained concealed. Cultural material was collected from Stratum II.

In 1993 the surveyors of the site recorded a straight razor, a door key, a tobacco can with a hinged lid, stove parts, and a coal pile of at least 500 pieces within Feature 2. This led to the interpretation that this foundation was the remains of the main domicile or bunkhouse/cookhouse that supported the ranching activities conducted at the site (Carrillo et al. 1993).

Cultural materials collected from the shallow cultural layers of these test units include nails, writing pen nibs, bottle/jar glass, window glass, chimney lamp glass, a

spark plug, buttons, and charcoal. These types of materials support the interpretation that this was the main domicile/bunkhouse at this site.

Test Unit 18

Feature 1, a possible seasonal habitation structure or animal pen at the southwestern edge of the site, was explored with two 1 m x 1 m test units (Test Units 18 and 20). To determine the function of this feature, test units were placed inside the structure's wall. Test Unit 18 abutted the west wall of Feature 1 and was excavated in three stratigraphic layers (Figure 9.4). The unit datum was placed in the northwest corner of the test unit at 79.34mN, 56.57mE, at an elevation of 0.37 masd or an arbitrary elevation of 100.37 m.

Layer 1 was a 2 to 4 cm thick overburden consisting of grasses and other plant matter. A large quantity of both rodent excrement and modern trash including MRE packaging and plastic utensils was noted. Glass and bulk bone were collected from the layer (Table 9.12).

Table 9.12. Test Units 18 and 20 artifact summary, 5LA6108.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
18	Layer 1	*	2 - 4 cm	12 glass fragments, 4 bulk bone	2 glass fragments, 1bulk bone, 1 macrobotanical sample, 1 gastropod sample
18	Layer 2	*	4 - 9 cm	1 fencing staple, 2 bulk bone	1 macrobotanical sample
18	Layer 3	*	8 - 10 cm	None	None
20	Layer 1	*	1 - 2 cm	1 miscellaneous metal	None
20	Layer 2	*	4 - 7 cm	None	None

*Excavated as a single stratigraphic layer

Layer 2 was a shallow layer (4 to 9 cm) of moderately developed sediments with over 50% gravels. One metal fencing staple and two bulk bone were recovered from the layer. Decaying sandstone comprised much of the 8 to 10 cm thick Layer 3. When no cultural material was recovered from this layer, excavation was terminated in Unit 18.

Two strata were identified in the profile of the east-facing west wall and three strata were identified in the north-facing south wall of Test Unit 18. They are described below (Figure 9.44).

Stratum I — Stratum I is a 5 to 9 cm thick overburden containing a high percentage of rodent excrement. The remaining sediments are a very pale brown to pale brown (10YR 7/3 to 7/4 to 6/3), single grained, silty loam. A moderate

amount of calcium carbonate and 15% sandstone gravels are also found in the layer. The lower boundary of Stratum I is clear and smooth. The stratum contained a small number of historic artifacts and modern trash.

Stratum II Stratum II is a 5 to 15 cm thick layer of moderately developed, blocky, very pale brown to pale brown (10YR 7/3 to 7/4 to 6/3), silt loam. Sandstone pebbles and cobbles increase to 20%. A moderate amount of calcium carbonate is again present in the stratum. The lower boundary is clear and irregular. One artifact was recovered from Stratum II.

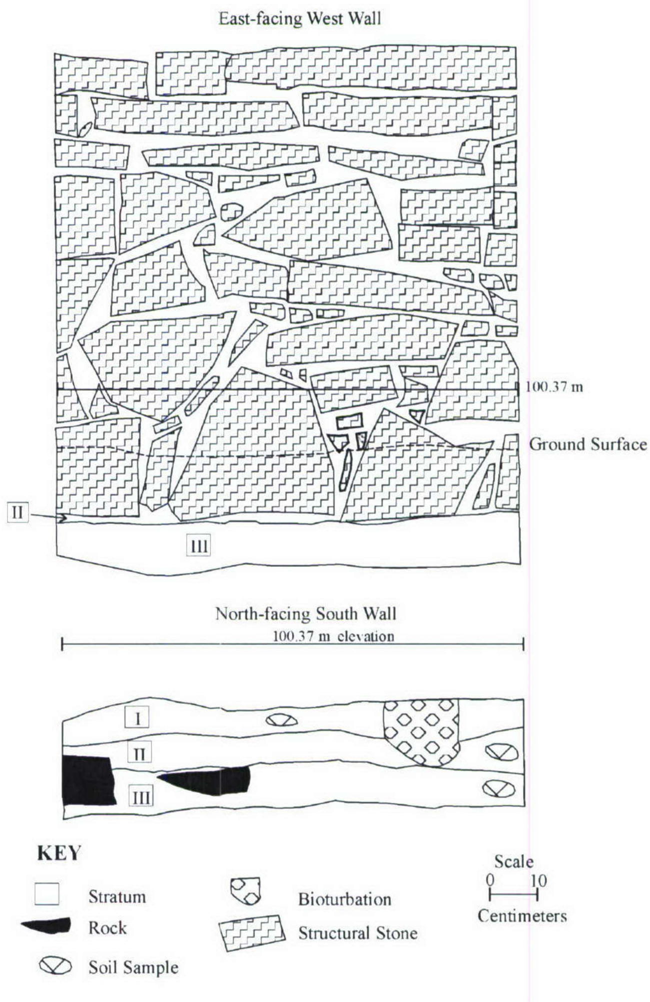


Figure 9.44. West wall profile and south wall profile, Test Unit 18, 5LA6108.

Stratum III Much of Stratum III consists of deteriorating sandstone bedrock (70%). The remaining sediments are a dark yellowish brown (10YR 4/4 to 3/6) loamy sand with a single-grained, blocky, weakly developed structure. No calcium carbonate is present. The upper 7 to 11 cm of the stratum was exposed, the lower boundary remained concealed. No cultural material was found in the stratum.

Test Unit 20

Test Unit 20 was also excavated within the interior of Feature 1 and east of Test Unit 18. The unit datum was set at 79.95mN, 57.38mE, at an elevation of 0.28 masd or an arbitrary elevation of 100.28 m. Two stratigraphic layers were completed before the same culturally sterile level encountered in Test Unit 18, Layer 3 was reached.

Layer 1 was a very thin (1 - 2 cm) layer of silty sediments containing pebbles and cobbles. One metal artifact was recovered (Table 9.12). Layer 2 was composed of sediments with a moderately developed blocky structure and a large quantity of cobbles. After 4 to 7 cm of excavation in Layer 2 the decomposing sandstone was encountered and excavations ceased. No cultural material was recovered from this layer. The unit reached a final depth of between 6 and 9 cm bgs.

Two strata were recorded in the south-facing north wall and the east-facing west wall of Test Unit 20 (Figure 9.45).

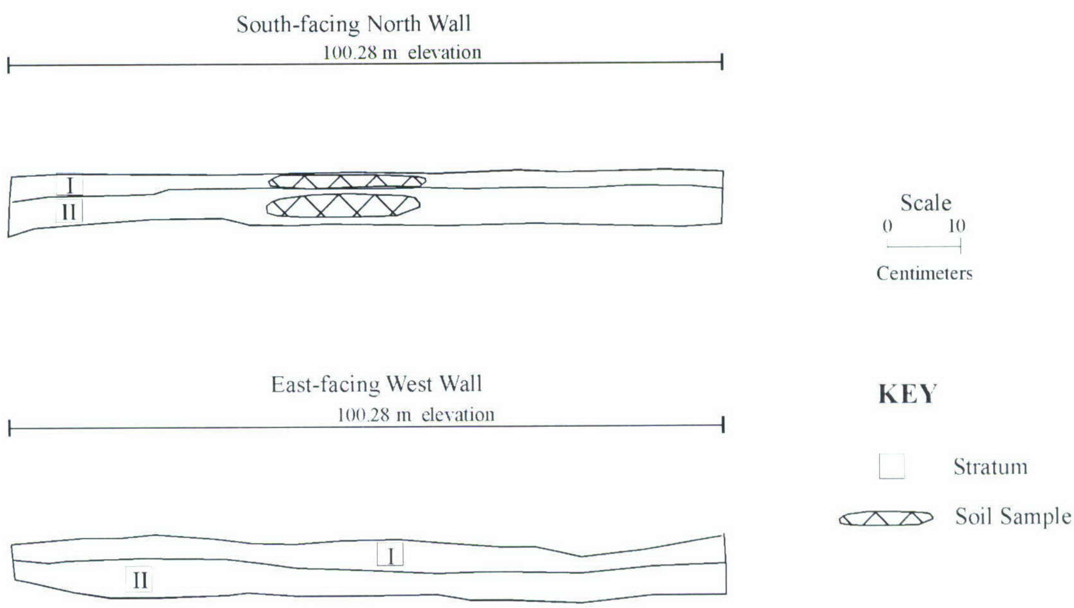


Figure 9.45. North wall profile and west wall profile, Test Unit 20, 5LA6108.

Stratum I — Stratum I is a thin (2 to 4 cm) layer of very pale brown to pale brown (10YR 7/3 to 7/4 to 6/3), single grained loam. Poorly sorted, angular pebbles and cobbles (15%), bioturbation and a moderate amount of calcium carbonate are found in the layer. The lower boundary is clear and smooth. One historic artifact was collected.

Stratum II — This sandy loam is a very pale brown to pale brown (10YR 7/3 to 10YR 7/4 to 10YR 6/3), weakly developed layer ranging from 3 to 5 cm thick. The peds are blocky and weakly developed. Sandstone cobbles (20%), bioturbation and a moderate amount of calcium carbonate are also evident in the layer. The floor of this unit rests at the break between Stratum II and Stratum III (exposed in Test Unit 18 and described above) making the lower boundary of the stratum clear and smooth. No cultural materials were collected from Stratum II.

Test unit excavations in Feature 1 yielded a small amount of bulk bone, glass, metal, and a large amount of modern trash, including MRE packaging. The small amount of artifacts recovered from this feature does not provide a clear indication of its function. A soil sample was sent to test for phosphorous (Appendix IV) to determine whether there is evidence that this may have been an animal pen. The results were inconclusive.

Test Unit 21

Test Unit 21 was a 90 cm x 1 m test unit placed within Feature 9 to test the original interpretation that this was a privy. Because of the small size of the feature, the entire area inside of the feature's wall was excavated (Figure 9.17). The edges of the test unit abutted the walls of the feature on every side. The unit datum was placed at 126.66mN, 96.80mE, at an elevation of .34 mbsd or an arbitrary elevation of 99.66 m. The control unit was positioned in the northeast corner. A metal pot lid and a piece of glass were collected from the surface before excavation began (Table 9.13).

Layer 1 consisted primarily of organic materials from the overhanging juniper trees. Roots and rocks were also present in the layer. Artifacts collected from Layer 1 included metal, leather, bulk bone, glass, egg shells, charcoal, and samples of organic material. Layer 1 was 7 to 10 cm thick.

In Layer 2 the sediments became more compact than those in Layer 1 but still remained quite soft. Disturbance from root growth continued from above. Decaying wood and charcoal were present in the layer. After excavating 6 to 10 cm the work was halted because of a concentration of rocks that was spread across the bottom of the test unit. It was unclear whether these rocks were slabs fallen from the surrounding walls or whether bedrock had been reached. Because of this, the sediments clinging to the structure walls were cleared in an attempt to discover the lower boundary of the stacked stone walls. Glass, leather, miscellaneous metal, historic ceramics, cork, bulk bone, eggshells, and charcoal were collected from this layer. The wall clearing made it evident that the structure walls rested on bedrock.

Table 9.13. Test Unit 21 artifact summary, 5LA6108.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
21	surface	--	--	1 metal lid, 1 glass fragment	None collected
21	Layer 1	✳	7 - 10 cm	30 miscellaneous metal , 6 bulk bone, 1 leather, 8 glass fragments, 1 shell sample, 1 charcoal sample	10 miscellaneous metal, 1 glass fragment, 2 bulk bone, 1 charcoal sample, 1 macrobotanical sample, 1 unknown sample
21	Layer 2	✳	6 - 10 cm	15 miscellaneous metal, 7 pieces of glass, 2 pieces of leather, 1 historic ceramic, 2 bulk bone, 1 shell	15 miscellaneous metal, 17 bulk bone, 1 cork, 1 shell sample, 1 charcoal sample, 1 unknown sample, 1 macrobotanical sample, 1 gastropod
21	Layer 3	✳	0 - 6 cm	1 bulk bone	None
21	Wall Clearing	--	--	6 miscellaneous metal, 10 bulk bone, 2 shell samples, 3 pieceso f leather, 1 glass fragment, 1 unknown sample	None collected

✳Excavated as a single stratigraphic layer

Although most of Layer 3 consisted of large bedrock slabs, the sediments (0 to 6 cm) between the slabs were removed. One fragment of bulk bone was collected from Layer 3 and its presence here was attributed to bioturbation. Test Unit 21 reached a final depth from between 16 and 22 cm bgs.

One "unknown" sample recovered from Test Unit 21 was sent to High County Macrobotanical Services for further analysis. The complete results of that analysis appears in Appendix II of this report. This sample was collected from the wall of the test unit after excavation of Layer 2. The sample contained 1.43 g of melted phytoliths (melted and fused grass silica), indicating burning.

Two strata were identified in the west-facing east wall and the south-facing north wall of Test Unit 21 (Figure 9.46).

Stratum I — Although little of the original 7 to 10 cm of topsoil remained after excavation, its stain was still visible on the rock walls. Most of the layer consists of organic material from the overhanging juniper trees. The remaining sediments are a light brownish gray (10YR 6/2), single grained, silty clay loam. A high percentage of calcium carbonate is present in the stratum. The lower boundary is diffuse and discontinous. Cultural material was collected from Stratum I.

Stratum II Stratum II is a 6 to 14 cm thick layer of dark brown (10YR 4/3), single grained to blocky loam. Poorly sorted angular gravels increase to 5 to 10%. Bioturbation and a slight amount of calcium carbonate are also found in the layer. The lower boundary rests on bedrock and is clear and abrupt. This stratum also contained cultural material.

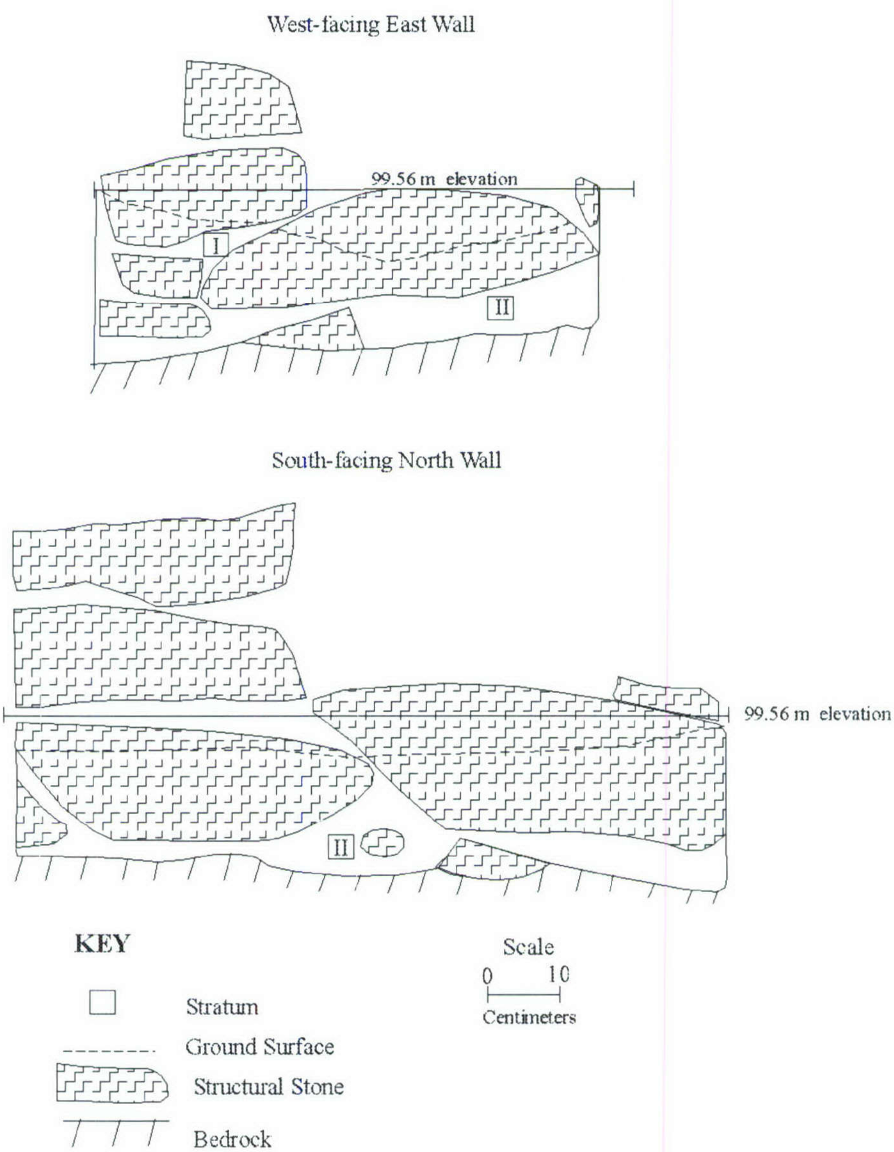


Figure 9.46. East wall profile and north wall profile, Test Unit 21, 5LA6108.

Although the original site form identified this feature as a possible privy, the nature of the cultural material collected, the predominantly soft, humic sediments, the shallow depth of the feature, and the very close proximity of this feature to the main domicile/bunkhouse structure suggests it may have used as an outdoor kitchen.

Test Unit 22

The final test unit to be discussed, Test Unit 22, was placed over a resistance anomaly. It was believed that the low readings indicated an area of deep sediments that might provide a deep exposure of the site's stratigraphy. The unit datum was placed at 89.65mN, 76.64mE, at an elevation of 0.35 masd or an arbitrary elevation of 100.35 m. Test Unit 22 was excavated in five stratigraphic layers to a total depth of between 67 and 69 cm bgs. Layer 1 was a 7 to 13 cm thick overburden layer of loose, platy sediments containing vegetation including prickly pear and grasses. One flaked lithic artifact was removed from this surface layer (Table 9.14). A change to Layer 2 was made when the sediments became more moderately developed and blocky. Layer 2 was 6 to 10 cm thick. Sediments continued to become more developed, indicating a third layer change. Layer 3 reached a thickness of between 9 and 12 cm. An increase in clay content and accumulations of gypsum signaled the change to Layer 4. The level thickness was increased to 20 cm for the remainder of the excavation to expedite the completion of the test unit. Layer 4 was 18 to 20 cm thick. The sediments of Layer 5 (20 to 21 cm) were predominantly shale mottled with red and yellow sediments.

Table 9.14. Test Unit 22 artifact summary, 5LA6108.

Test Unit	Layer	Level	Thickness	Materials Recovered	
				1/4"	1/16" Control
22	Layer 1	✳	7 - 13 cm	1 flaked lithic artifact	None
22	Layer 2	✳	6 - 10 cm	None	None
22	Layer 3	✳	9 - 12 cm	None	None
22	Layer 4	✳	18 - 20 cm	None	1 unknown sample
22	Layer 5	✳	20 - 21 cm	None	1 unknown sample

✳Excavated as a single stratigraphic layer

Four strata were identified in the east-facing west wall and the north-facing south wall of Test Unit 22. They are described below (Figure 9.47).

Stratum I — Stratum I is a 10 to 19 cm thick layer of light brownish gray to grayish brown (10YR 6/2 to 5/2), silty clay. The weak pedogenic structure is single grained to blocky with rounded peds. Roots and calcium carbonates are present in the stratum. The lower boundary is clear and smooth. One lithic artifact was collected from Stratum I.

Stratum II — Stratum II is a pale brown to brown (10YR 6/3 to 5/3), silty clay ranging in thickness from 9 to 27 cm. The peds are angular and blocky and

moderately well developed. Sediments react moderately to violently to hydrochloric acid. The lower boundary is clear and smooth. No cultural material was recovered from this stratum.

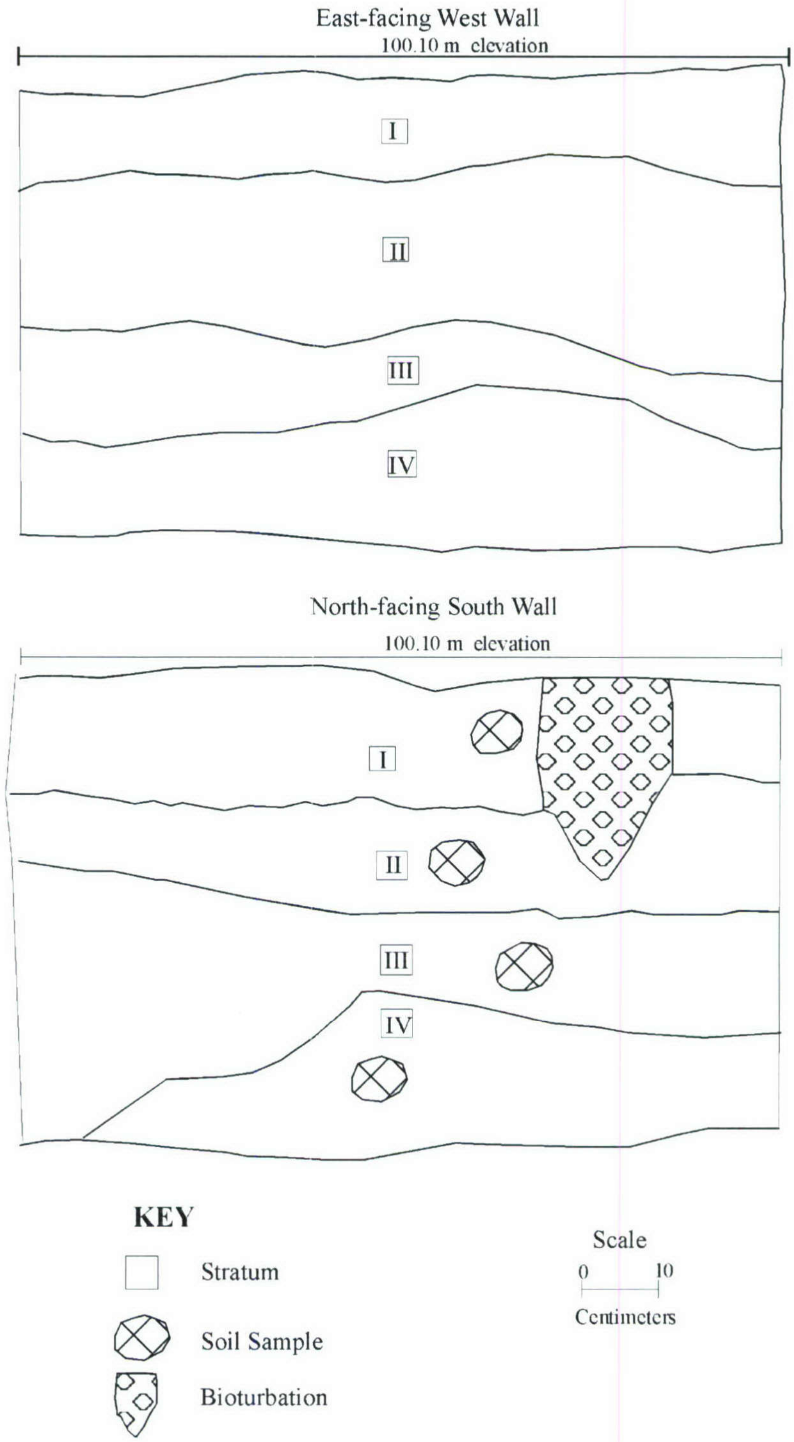


Figure 9.47. West wall profile and south wall profile, Test Unit 22, 5LA6108.

Stratum III This 5 to 38 cm layer is a light gray to very pale brown (10YR 7/2 to 7/3), well developed, silty clay with angular to blocky peds. The sediments react violently to hydrochloric acid. The lower boundary is clear and smooth except in the southwest corner where the lower boundary is concealed. No cultural material was present in this layer.

Stratum IV Stratum IV is a brownish yellow (10YR 6/8), silty clay with a moderate to well developed structure. The peds are angular and blocky. The layer is also composed of 65% angular pebbles. The sediments react moderately to violently to hydrochloric acid. The lower boundary of Stratum IV remained concealed. Cultural material was not present in Stratum IV.

The stratigraphic profile indicates that this may have been an area of accumulated eolian sediments exposed to periods of standing water. The possibly gleyed sediments and deposits of gypsum just prior to sandstone bedrock were affected by redoxification causing significant red and yellow mottling of the sediments in Stratum IV.

Historical Research

The goal of the historic research was to summarize the general pattern of the historic settlement of the area and to position this site within that time frame. Additionally, historical archival research was undertaken to personalize the historic settlement pattern by identifying ownership and to identify the types of economic activities engaged in.

As outlined in the cultural history chapter (Chapter 2) of this report and also under the historical research section for site 5LA3333 (Chapter 6), the period of Early Settlement is generally considered to be 1849 - 1890. This time period encompasses the formation of the first cattle and sheep ranches and communities in the PCMS. The first big settlement boom came just after the passage of the Homestead Act of 1862. This act specified that settlers could claim up to 160 acres of public domain if they proved they lived on the property and cultivated it. A second wave of settlement was tied directly to the passage of the Enlarged Homestead Act of 1909 and the Stock Raising Homestead Act of 1916.

According to Friedman (1985), settlers with Hispanic surnames were largely occupied with sheep ranching/herding while those of Anglo-American descent were cattle ranchers. By the beginning of the 20th century most of the ranches in the northern portion of the PCMS ran cattle while the southern portion was dominated by sheep herders or ranchers (Friedman 1985).

An internet search of the Bureau of Land Management records showed that a land patent for Township 28 South, Range 57 West, Section 14 was issued to Henry Alfred Barnes on February 25, 1922, under the Stock Raising Act of 1916 (Figure 9.48).

4—1007-R.

Pueblo 032961.

The United States of America,

To all to whom these presents shall come, Greeting:

WHEREAS, a Certificate of the Register of the Land Office at Pueblo, Colorado, has been deposited in the General Land Office, whereby it appears that, pursuant to the Act of Congress of May 20, 1862, "To Secure Homesteads to Actual Settlers on the Public Domain," and the acts supplemental thereto, the claim of Henry Alfred Barnes has been established and duly consummated, in conformity to law, for the Section fourteen in Township twenty-eight south of Range fifty-seven west of the Sixth Principal Meridian, Colorado, containing six hundred forty acres,

according to the Official Plat of the Survey of the said Land, returned to the GENERAL LAND OFFICE by the Surveyor-General:

NOW KNOW YE, That there is, therefore, granted by the UNITED STATES unto the said claimant the tract of Land above described; TO HAVE AND TO HOLD the said tract of Land, with the appurtenances thereof, unto the said claimant and to the heirs and assigns of the said claimant forever; subject to any vested and accrued water rights for mining, agricultural, manufacturing, or other purposes, and rights to ditches and reservoirs used in connection with such water rights, as may be recognized and acknowledged by the local customs, laws, and decisions of courts; and there is reserved from the lands hereby granted, a right of way thereon for ditches or canals constructed by the authority of the United States. Excepting and reserving, however, to the United States all the coal and other minerals in the lands so entered and patented, together with the right to prospect for, mine, and remove the same pursuant to the provisions and limitations of the Act of December 29, 1916 (39 Stat., 862).

IN TESTIMONY WHEREOF, I, Warren G. Harding, President of the United States of America, have caused these letters to be made Patent, and the seal of the General Land Office to be hereunto affixed.

GIVEN under my hand, in the District of Columbia, the TWENTY-FIFTH day of FEBRUARY in the year of our Lord one thousand nine hundred and TWENTY-TWO and of the Independence of the United States the one hundred and FORTY-SIXTH.

(SEAL.)

By the President: Warren G Harding

By Viola B. Pugh, Secretary.

M. P. LeRoy

Recorder of the General Land Office.

RECORD OF PATENTS: Patent Number ... 851644

Figure 9.48. BLM land patent to Henry Alfred Barnes, 1922.

The Homesteading Acts specified that the settler must live on the land and make improvements upon it. Generally, those who took the time and made the effort to build homes and other structures were the most likely to apply for land titles. Most often it took five years for a homesteader to "prove up" their claim. If this holds true, then it would be expected that Henry Alfred Barnes could have lived on the land as early as 1917.

Although the initials "HB", discovered on a piece of concrete during the excavation of Feature 15, seems to provide a clear connection to Henry Barnes, a search of the Soundex cards for the 1920 United States Federal Census had no record of Henry Alfred Barnes in this area. If the general pattern of historic settlement holds true for this homestead, it is speculated that given the far northern location of this site within the PCMS and the Anglo-European surname of the landowner, the inhabitants may have been cattle ranchers rather than sheepherders. The large size of the corral may also support the idea of a cattle operation (Friedman 1985). However, in the absence of other evidence this remains speculative. No other information specific to this landowner was available.

Material Culture

Historic Artifacts

Ceramics

Forty-five historic ceramic sherds were recovered from subsurface testing at the site. Two additional sherds with decoration not found elsewhere on the site were collected from the surface of Feature 12, the historic trash deposit. Of the total sample, 35 fragments (74.5%) were collected in Feature 5, nine (19.1%) from Feature 2, one (2.1%) from Feature 9, and two (4.3%) from Feature 12. Porcelain and whiteware are the only types of historic ceramics that were collected from the site. Crockery was observed in Features 12 and 13 but was not collected.

Porcelain Six fragments of porcelain account for 12.8% of the historic ceramic assemblage. Five of these were found in Feature 5. They represent pieces of a nearly complete small plate with a green "RS Germany" maker's mark. The small plate (Figure 9.49) is decorated with two flowers using shades of orange, yellow, green, and brown and is gilded along the outer rim. Originally manufactured under the name "RS Prussia", production on this European tableware began in 1869 by Reinhold Schlegelmilch in Suhl, Germany (Gaston 1995:9). This popular porcelain was known for its complex floral and scenic designs and animal molds. Decorations were first applied using the outline transfer method with some handpainting. The outline transfer method was generally replaced by full color decalcomanias in 1900 (Gaston 1997:introduction). Early pieces generally bore the RS Prussia mark although other marks including "RS Silesia", "RS Tillowitz", and "RS Steeple" were also manufactured by this company. Schegelmilch's son Erhard opened another factory in Tillowitz, Germany, in 1895 and in 1910 began using the "RS Germany" trademark in green. Although the company sent their products to many different countries, export to America was one of their greatest mainstays (Gaston 1999:13). The "RS Germany" pieces were generally more simple floral designs and

shapes. These were especially popular in the 1920s. The "RS Prussia/RS Germany" tableware was in production until after WWII when the company came under the management of the Polish government (Gaston 1995:9-14). The decoration on the specimen found at the site was applied using an over glaze technique. This was apparent in the way the design is scratched or "rubbed" off in places. The design shown on this plate, known as "Orange Poppies", was reproduced on other pieces manufactured by the RS Prussia company including those using trademarks other than the RS Germany mark.

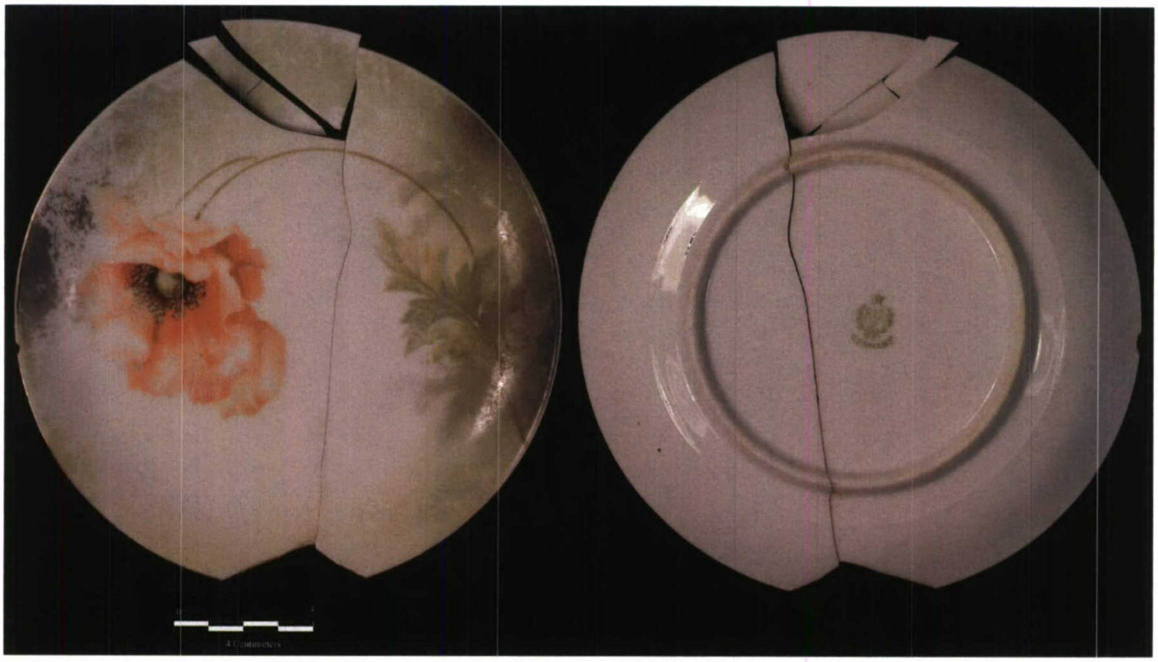


Figure 9.49. Porcelain plate, Feature 5, 5LA06108.000.187 and 5LA06108.000.188.

One additional fragment of porcelain was collected from Feature 12. This small sherd has a decalcomania decoration covering it in shades of green, pink, lavender, and blue forming circles and what may be a portion of a floral pattern.

Whiteware Forty-one or 87.2% of the collected historic ceramics are whitewares. Six pieces are decorated and thirty are slipped. Five of the pieces are too small to make any determination about their decoration. The decorated pieces include five fragments collected from the test unit excavated in Feature 5. At least four appear to be from the same vessel, likely a small saucer (Figure 9.50). These pieces have a floral decalcomania decoration in light blue and green. Four of these are rim pieces with a slightly scalloped and gilded edge. The largest piece has a small portion of a maker's mark. The fifth fragment may also be from the same vessel. The small amount of decoration on the piece makes determination inconclusive. One additional piece of decorated whiteware was collected from the surface of the historic trash dump (Feature 12). This sherd is the rim of a saucer or small plate that has a gilded edge and a gilded motif running through its middle. The plate has a flow blue decoration that is overlying a relief pattern along the edge of the sherd (Figure 9.50).

Thirty of the whiteware fragments collected are slipped and are the same color on both the vessel's interior and exterior. Four fragments are slipped in a cream or beige color and have no defining characteristics to suggest the vessel type. Three of these fragments were collected from Feature 2 and one was collected from Feature 9. The other 26 slipped whiteware fragments have a white interior and exterior surface. Five fragments are from a small saucer, one appears to be part of the base of a small cup, and five are from a large mug or small pitcher (one base piece and four rim pieces). No defining characteristics were observable on the remaining 15 fragments. All but one piece of the white-slipped whiteware was collected from Feature 5. The final piece of slipped whiteware was collected from Feature 2.

Figure 9.50. Whiteware fragments, Feature 5, 5LA06108.000.189, 5LA06108.000.190, and 5LA06108.000.192.

Glass

A total of 523 glass fragments were collected from the site. Bottle/jar glass comprises 47.3% of the total. Flat or window glass (33.2%) is the second most predominant glass type. Glass from hurricane lamp chimneys (11.5%) and unidentifiable glass (8%) account for the remainder of the assemblage.

Bottle/Jar Glass A total of 248 bottle or jar glass fragments were collected. Most of the bottle/jar glass assemblage is very fragmented. It is interpreted that these are predominantly body fragments including some shoulder pieces (236 fragments or 95.2%). No complete bottles were collected; only one bottle with a distinct

manufacturer's mark was found. The assemblage includes six base fragments and six neck/finish fragments. Colors represented include clear, brown, aqua, light green, and solarized purple (Table 9.15).

Table 9.15. Bottle/jar glass by percent and by color, 5LA6108.

	Percent	Total
Solarized purple	6.4%	16
Light Green	14.1%	35
Aqua	22.6%	56
Brown	23.0%	57
Clear	33.9%	84
	100%	248

Several clear glass fragments with scalloped shoulders, possibly parts of ketchup or mustard bottles, were recovered from Feature 1. Two solarized purple glass body fragments can be pieced together to make the word "MEDICIN". The light green bottle glass pieces were all found in close association with one another. Several of the specimens appear to have faint red paint on them indicating that a design or manufacturer's name had originally been painted on them but is now indecipherable. Two other small fragments of clear glass have embossing but are too small to discern any other information. Other identifying features are outlined below.

Mold Thirteen specimens of bottle or jar glass have examples of mold seams. The glass is so fragmentary that there is little evidence of the type of mold used. Four of the base fragments were likely manufactured using the cup bottom mold technique. One additional bottle base exhibits evidence that suggests it was produced using the Owens automatic bottle machine. The remaining eight mold-seam examples are body fragments that are too incomplete to make a type determination.

Finish Four aqua glass fragments fit together to form a portion of a threaded jar seal finish of a household jar. One additional specimen of a threaded jar finish from an aqua household jar was also collected. Only one other relatively intact bottle finish was collected. This clear glass fragment has a rounded lip and widened neck of a reinforced extract finish type (Dean 1992).

Bottle Manufacturer Only two bottle/jar fragments had any marking on their base. The first is the most complete bottle collected from the site. This clear bottle has "Sloan's Liniment Kills Pain" embossed on its side (Figure 9.51) and has a small diamond shape on its base. The base is rectangular and slightly concave with a diamond embossed in the center. The diamond has a "009" embossed inside of it. This bottle may have been manufactured by the Diamond Co. Sloan's Liniment was manufactured by Earl S. Sloan beginning in 1902 (Fike 1987:137). The other base is a round aqua base that is slightly concave with concentric circular grooves in the center with "9", "6" or "g" on the bottom

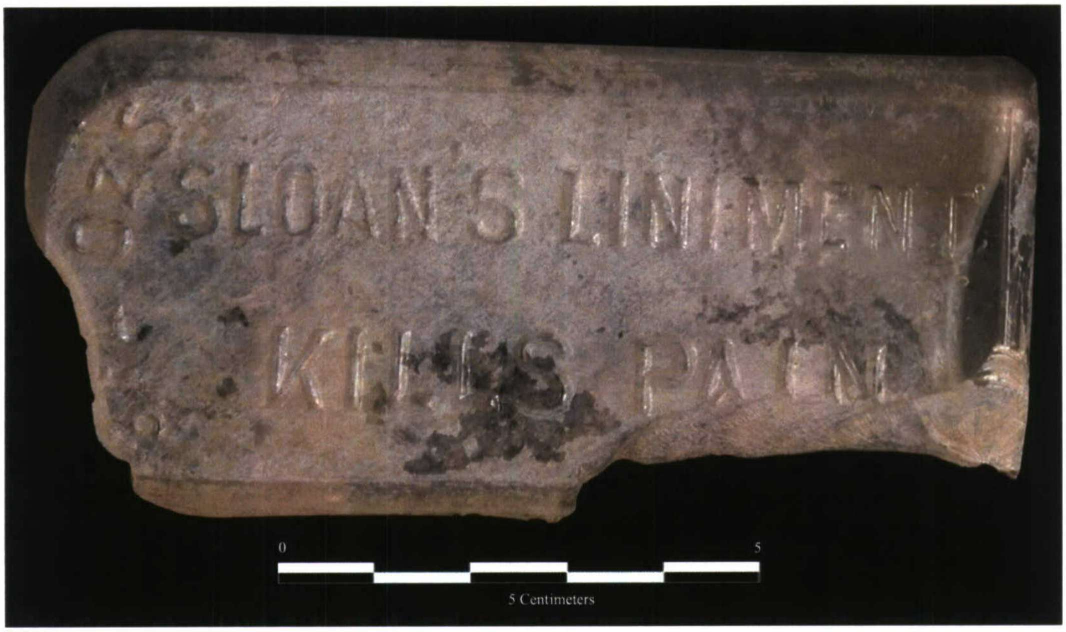


Figure 9.51. Bottle panel, 5LA06108.000.219.

<u>Modified Glass</u> The original site form noted that much of the glass recorded at the surface appeared to be modified (Carrillo 1993 et al.). A relatively high percentage of flaked or retouched glass was also noted during the analysis. Because of the condition of the glass, which becomes pocked and chipped through breakage and natural processes, only glass that appeared to have the most definite signs of patterned retouch were recorded. A more detailed analysis may reveal a greater quantity of modified glass which delineates those pieces that may have been utilized rather than retouched. A similar methodology to identify patterned, retouched flaked lithic artifacts was used for the modified glass. A total of twenty-three bottle/jar glass fragments were identified as having patterned retouch on one or more edges. Twelve of these "glass tools" were manufactured from aqua glass, five from clear glass, four from brown glass, and two from solarized purple glass. Seventeen of the worked glass fragments showed evidence of unimarginal retouch. Three glass fragments had bimarginal retouch and three had unimarginal and bimarginal patterned modification.

<u>Flat/Window Glass</u> Of the total glass collected, 174 fragments were considered flat, or window glass. The vast majority, 170 sherds or 97.7%, came from the three test units placed inside Feature 2, the domicile. Two fragments were collected from the privy and two from Feature 1 (the barn). Fourteen of the flat glass specimens were clear glass; all others were light green.

<u>Chimney Glass</u> Sixty pieces of glass were classified as hurricane lamp chimney glass including two pieces of the chimney crown. Six of the fragments were found in Feature 5 (privy) and all others were found in Feature 2. Thirty-nine of the fragments were solarized purple glass. The remaining specimens were clear glass.

Other Glass Three large pieces of clear glass were refit to form the cover of a large canister, possibly a cookie or candy jar. One piece of milk glass, one shard of cut glass, and two pieces of burned glass are identified from the 41 fragments. The remaining 38 fragments were too small to identify.

The vast majority of all glass (76.1%) was collected from Feature 2. This includes bottle and jar glass, flat or window glass, chimney lamp glass, and glass that remains unidentified. The most complete example of the bottle glass collected, the partial Sloan's Liniment bottle, was recovered from Feature 9. Most of the other glass was so fragmentary as to preclude anything other than the most basic identification of glass color and type. Table 9.16 provides a breakdown of the distribution of glass types by feature.

Table 9.16. Distribution of glass types by feature, 5LA6108.

Feature No.	Bottle/Jar Glass	Flat Glass	Chimney Glass	Other	Total	%
Feature 1	12	2	--	1	15	2.9
Feature 2	155	170	54	19	398	76.1
Feature 4	--	--	--	13	13	2.5
Feature 5	24	2	6	4	36	6.9
Feature 7	2	--	--	--	2	0.4
Feature 9	16	--	--	2	18	3.4
Feature 15	38	--	--	2	40	7.6
Extramural Unit	1	--	--	--	1	0.2
Total	248	174	60	41	523	100

Metal

Metal artifacts were found throughout the site. A portion of the metal collected from the site is extremely corroded and fragmentary and therefore is difficult to identify. A total of 254 metal artifacts were identified. Wire nails make up over half of the assemblage (70%). Fasteners (7.8%), miscellaneous metal (7.8%), staples and wire (5.1%), household items (3.9%), cans (2.7%), and cartridge casings (2.7%) comprise the rest of the metal artifact assemblage.

Cartridge Casings Seven cartridge casings were recovered during subsurface testing (Table 9.17). One cartridge was recovered from Feature 2, the domicile, one was recovered from the dugout (Feature 4), and five were collected from the excavation of Feature 5, the privy. Both single rim fire (2) and center rim fire (5) cartridges were found representing four different cartridge calibers: .22, .30, .38, and .41(2). The date ranges given below were taken from Barnes 1971:4,163,273, Bearse 1966:119, and Logan 1959:63.

Table 9.17. Cartridge casing types, 5LA6108.

Catalog Number	Headstamp Description	Cartridge Type	Body Dia. (inches)	Caliber	Length (inches)	Date Range
5LA06108.000.040	.38 S&W U.M.C.	center fire	.389	38	.767	post 1877
5LA06108.000.041	U	single rimfire	.224	22	.417	1867 - present
5LA06108.000.042	unknown	single rimfire	--	22	--	--
5LA06108.000.043	.303-SAV REM-U.M.C.	center fire	.440	30	2.022	1896 - present
5LA06108.000.044	.41 S.D.A. WRA Co.	center fire	.410	41	.629	1884 - 1950
5LA06108.000.045	.41 S.D.A. WRA Co.	center fire	.412	41	.622	1884 - 1950
5LA06108.000.046	.303-SAV REM-U.M.C.	center fire	.468	30	2.030	1896 - present

Wire Nails A total of 177 wire nails were collected from subsurface testing. A breakdown of the nails by feature is shown in Table 9.18. The largest percentage of nails were recovered from the domicile (48.6%) and the double-walled structure (39.5%). Most notable among the nails collected is the high percentage of tack-sized nails (sometimes referred to as Hobbarts tacks) from Feature 2. Nails this size are often used for upholstery finishing. In Feature 7, however, nails were larger carpentry nails which, considering the amount of decomposing wood found in this feature during excavation, may have been used for shelving or for a more substantial roof than on the other structures at the site. Carrillo et al. (1993) speculated on the original site form that the low percentage of nails observed in the vicinity of Feature 2 might suggest a canvas or less substantial roof over this structure. The lack of carpentry nails recovered from the three test units excavated in this feature may lend credence to that interpretation. Twenty-eight or 15.8% of the nails collected were too bent or corroded to determine size.

Fasteners Twelve grommet/eyelets were recovered. Eleven of these are small and are most likely shoe eyelets. Four have distinguishing marks on them. One larger grommet may have come from a tarp. In addition, the remains of eight snap fasteners were collected; five were complete sets, two included only the male half, and one female half was recovered. Seven of these snaps have letters or designs imprinted on them. The head of one large safety pin was also collected. Of the clothing/household-related items, 14 were found in the domicile (Feature 2) and 7 were recovered from Feature 5 (the privy).

Table 9.18. Wire nail distribution by feature, 5LA6108.

Feature	Pennyweight	Total Qty	% by Qty	Weight (g)	% by Wgt
Feature 2	<1" (61), 3d (1), 4d (2), 5d (3), 6d (4), 8d (9), 10d (1), 16d (1), 30d (1), frag (3)	86	48.6	102.2	43
Feature 4	8d (1), 16d (1), frag (1)	3	1.7	15.6	6.6
Feature 5	<1" (10), 3d (2), 5d (1), frag (1)	14	7.9	14.2	6.0
Feature 7	3d (13), 4d (3), 5d (14), 6d (18), 7d (1), frag (21)	70	39.5	98.3	41.4
Feature 9	3d (1), frag (2)	3	1.7	4.8	2
Feature 15	8d (1)	1	0.6	2.3	1
Total		**177**	**100**	**237.4**	**100**

Staples and Wire Five staples of varying sizes were collected. Three are thick, fencing staples and two are manufactured from a much thinner wire. Eight other miscellaneous pieces of metal wire were collected. Four are simple fragments of single strand, non-barbed wire varying in thickness from 1/16 in to 1/8 in. Two are thin wire scraps with metal tags attached to them–one has a small metal tab (3/8 in x 1/2 in) and the other a larger tag (1 1/2 in x 1 in) with two oblong holes in the middle. The remaining two wire artifacts were formed by twisting non-barbed wire into a two-strand thick piece with a large half circle loop at the end. These may have been used as hay bale handles.

Household Items Two fountain pen nibs, a shoe horn, and a belt buckle were collected from the domicile (Feature 2). A pot lid and two metal plates were recovered from the nearby Feature 9. One paper clip was found in Feature 4, the dugout to the east of the domicile. One roll strip can opener key, first used around 1895 and still in use today, was recovered as was one continuous thread bottle cap which came into popular use after 1919 (Lief 1965).

Cans Two nearly complete metal cans were collected. The remains of cans are also represented by three lids, two bail handles, and fragments that include several can rims. One of the cans, recovered from deep within the dugout (Feature 4), is an oblong seafood can that would likely have used a key method of opening. The can, although extremely corroded, appears to have been cut in a single piece like those made after the 1880s (Gillio et. al. 1980). A single crushed and corroded machine soldered can, likely a sanitary can, of the type used extensively in the West by 1911 (Rock 1988) was also collected. Three tin can lids were recovered from the site. One is a sanitary can lid; the other two are paint can type lids. One of the lids is very badly corroded which makes it difficult to tell what the method for opening might have been. The other is a removable lip lid (Dean 1992). Cans using this type of lid first began to be used about 1906 (Berge 1980). One of the metal can bail handles is square and the other is a rounded handle smaller than a pail/bucket handle. Some corroded metal fragments were also identified as can remains because of the can rims found with them.

Framing Connectors These three examples of carpentry hardware were found in Feature 2 and could have been used in a door or window frame.

Cotter Pin This 1 1/2 in long pin was collected from Feature 2.

Copper Ring Although badly crushed, this artifact was likely a ring used for personal adornment and probably held some kind of stone. It was collected from Feature 2.

Large Clip Possibly the remains of a Doubletree clip or other wagon hardware (Spivey 1979:22), this 2 7/8 in long, curved metal specimen was recovered from Feature 2. The thickest portion of the clip is at the rounded end (3/8 in). It then tapers toward the ends which are broken and missing.

Metal Torsion Spring The remaining portion of the spring is 1 9/16 in long and was recovered from Feature 2.

Large Metal Tack This bent and broken tack has a large head and may be an upholstery stud. This artifact was collected from Feature 2.

Metal Rivet This iron piece is 2 in long. It is 3/8 in wide at one end then tapers to 1/4 in at the other end. Both ends have some evidence of damage from pounding. This rivet was found in Feature 2.

Champion Sparkplug The words "CHAMPION/REG. 17.5 PAT. OFF" appear on the surface of the sparkplug. This porcelain and metal item was dated after 1907 by the original investigators citing Hull-Walski and Ayres 1989 (Carrillo et. al. 1993). This artifact was collected from Feature 2.

Metal Ring One metal ring, likely a harness ring, with a circumference of 1 3/16 in was collected from Feature 9.

Gate or Door Latch Hook This 4 1/4 in long door hook was found in Feature 5.

Hooks Two hooks were formed from wire (1/8 in thick). They were bent to form a rectangular shape with one end extending to form a small hook with a sharp point. The rectangular portion is 2 1/8 in long. The hook is an additional 1 in long. One hook was retrieved from Feature 1: one was collected from Feature 9.

Cleat or Bracket This 4 1/2 in long iron cleat was collected from Feature 2.

Metal Base Plate Recovered from Feature 15, this metal plate has two small holes that indicate it may have been an attachment to a larger piece of equipment. One corner is rounded; all other edges are broken and corroded.

Tabular Steel Piece This piece is 1 3/4 in long and 1/4 in wide, with one end folded over. Two small holes that are pierced through the folded end and the middle of the artifact suggest it may be a picture frame or wall hook. This artifact was collected from Feature 2.

Miscellaneous Metal Three remaining metal artifacts include two figure-eight shaped pieces with corroded remains attached at each end, possibly indicating their attachment to a larger object. One oblong item with a hole at each end may be a shackle link. (Spivey 1979:33). These artifacts were collected from Feature 2 and Feature 9 respectively.

Unidentifiable Metal Fragments A portion of the metal assemblage is to corroded and fragmentary for description. By weight, this metal accounts for 150.6 g or 8.67% of all metal collected and was found in Features 1, 2, 5, 9, and 14.

Because some portion of the metal collected from the site is extremely corroded and fragmentary, the distribution of metal by weight is provided in Table 9.19. The highest percentage of metal by weight (39.1%) is found in Feature 9. This total is somewhat skewed by the presence of two metal plates, a pot lid, and a large paint can lid. Feature 2 had the second highest amount of metal by weight (23.6%). Features 1, 4, 5, 7, 15, and extramural Test Unit 16 also contained metal artifacts but in considerably lower percentages.

Leather

Three samples of unidentifiable, weathered and fragmented leather were collected from Feature 9. No clues to its original form are discernible.

Textiles

Three samples of a dark brown, woven material were recovered. One very small piece was found in Feature 5 and two were found in Feature 7. One other sample of a synthetic hair-like material was collected from Feature 5.

Newspaper

Two samples of conglomerations of materials that are mostly unidentifiable but which clearly have small bits of newspaper in them, were collected from Feature 5. On one small piece the words "and" and "knit" are decipherable; on another, the word "earth" is visible.

Cork

One small round piece of cork, likely a bottle stopper, with a circumference of 5/8 in was collected from Feature 9.

Concrete

A small sample of the coarse concrete used in the wall of the cistern (Feature 15) was collected.

Table 9.19. Distribution of metal artifacts by weight (g), 5LA6108.

Feature #	Cartridges	Wire Nails	Staples/Wire	Household Items/Fasteners	Tin Cans	Misc. Metal Objects	Metal Fragments	Total Wtg. (g)	%
Feature 1 poss. barn	--	--	5.4	--	--	--	21.9	**27.3**	**1.6**
Feature 2 domicile	3.0	102.2	84.1	33.2	23.7	150.8	13.1	**410.1**	**23.6**
Feature 4 dugout	--	15.6	3.4	0.7	128.0	--	--	**147.7**	**8.5**
Feature 5 privy	26.3	14.2	--	2.8	5.9	46.7	48.3	**144.2**	**8.3**
Feature 7 double-walled structure	--	98.3	--	--	11.8	3.7	--	**113.8**	**6.6**
Feature 9	--	4.8	11.6	333.8	232.1	31.6	65.6	**679.5**	**39.1**
Feature 14 tent platform	--	--	--	--	--	--	1.7	**1.7**	**.1**
Feature 15 cistern	--	2.3	61.2	3.5	--	28.8	--	**95.8**	**5.5**
Extramural Test Unit 16	--	--	--	--	116.9	--	--	**116.9**	**6.7**
Total	**29.3**	**237.4**	**165.7**	**374.0**	**518.4**	**261.6**	**150.6**	**1737.0**	**100**

Feather One small portion of a feather was recovered from the privy. The species of bird is not known nor was it determined whether this feather was cultural.

Buttons

Shell Nine, mostly whole, shell buttons were found at the site. Seven buttons were collected from Feature 5; two were found in Feature 2. Eight of the buttons are 4-hole, sew-through type buttons. One button is a 2-hole, sew-through button. Button sizes include 24 lines or 5/8 inch in diameter (5 buttons), 22 lines or 9/16 inch in diameter (3 buttons), and 18 lines or 3/8 inch in diameter (1 button). The smaller button is most likely a shirt or dress button. The larger ones are probably from vests, coats or jackets (Gillio et. al. 1980).

One 24 line button is smooth on both the front and back; all others are smooth on the back but the portion containing the holes is inset on the front. Buttons with this smooth back generally post-date 1900 (Gillio et. al. 1980).

Copper Five examples of what are believed to be copper buttons were collected from Feature 5. All of these are extremely corroded and oxidized. Small bits of fabric can be seen still attached to a few of the specimens. No decoration was detected on any of them.

Trash Deposits

One part of the surface investigations conducted at the site included recording artifacts observed on the surface of Feature 12 and noting diagnostic artifacts seen in Feature 13, both are areas where trash was deposited. Although these artifacts were recorded but not collected, they are discussed here because of the large number of artifacts involved.

Feature 12 A total of 791 artifacts were field recorded for Feature 12. This total represents only those artifacts easily observed on the surface. Table 9.20 is a complete list of the artifacts recorded in Feature 12. Despite the fact that only two tin cans were collected during subsurface testing, metal cans were the most prevalent artifact in Feature 12. Of the mostly complete cans noted, 267 are sanitary cans and 192 are evaporated or condensed milk cans. Also included are coffee, tobacco, cooking oil, lard, and meat tins. One coffee can has the words "Wedding Breakfast" on it and one coffee lid says Dwinell-Wright Co. Several of the sanitary cans have can makers stamped on them including Canco, Bogue-Wensley, Denver and what appears to be "Enfasons". Two crushed oil cans have patent dates of Sept. 13, 1898 on their spouts. Other metal artifacts included a possible shoe tree base, an enamelware ladle bowl, an enamelware basin, a barrel strap, a lantern part, and a 12 guage centerfire shotgun cartridge with the headstamp "REM UMC ARROW No. 12". In all, 536 metal artifacts were field recorded in Feature 12.

Two historic ceramic sherds that were not represented elsewhere on the site were collected for analysis. These were previously described. The remaining ceramic

fragments observed likely make up less than six vessels. The 62 ceramic fragments observed included porcelain, decorated and plain utilityware, whiteware, and crockery.

Canning jars were the most common type of glass recorded. A lower percentage of bottle glass was observed. One jar has the words "Mason" on it and one read "Atlas, Mason". One definite liquor bottle was recorded (crown finish) along with a small amount of brown glass that is likely beer bottle glass. Other glass colors include solarized purple, aqua, clear, and milk glass. The milk glass noted was a cold cream jar with an aluminum screw top lid and four jar cap liners. One of these has the words "Genuine Boyd Cap" on it. There is also a small amount of decorative glass, one clear drinking glass, one solarized decanter or carafe, and one purple glass goblet. Two fragments of glass refit to form an embossed label that says "PATENT NOV 30TH 1858". A total of 187 bottle and jar glass specimens were recorded. Six pieces of window glass were also observed.

<u>*Feature 13*</u> The following artifacts were observed in the smaller trash deposit that covered the area surrounding the pathway leading from Feature 2 to Feature 5. These include the following: one metal cartridge with headstamp "303 SAV."; two clear glass fragments that refit to spell, "H.J. Hent" with what looks like "191" in the center; two pieces of gallon crockery with a label that says "Western Pottery Mfg. Co.; one metal button that says "Pay Day"; one solarized bottle finish and neck with a hand lipped mold seam that reaches to the base of the finish; two coffee cans with label "Wedding Breakfast Coffee is guaranteed only when label is unbroken"; one Calumet Baking Powder can, 5lbs, and one clear bottle finish (patent lip finish) with mold seam and words "...5/8 oz. Purple and aqua glass were also noted.

While the earliest patent dates for some of the items found in these trash deposits include dates from the mid-1800s (condensed milk cans first patented in 1856, hinged tobacco cans first introduced in 1870, Calumet Baking Powder first introduced in 1889 and the two dates [1858, 1898] visible on artifacts in the trash) (IMACS 1992), the overall artifact assemblage does not support an early date for the trash deposit. In fact, the Canco label was used by the American Can Co. only after 1910 (IMACS 1992). The large number of sanitary cans and the lack of hole-in-top cans suggest a date consistent with the issuance of the land patent, i.e. 1920s.

Prehistoric Artifacts

The surface artifacts collected from this site include one projectile point, three flaked lithic tools, two metate fragments, and one complete mano. In addition, 124 non-tool, flaked lithic artifacts were identified in the field and analyzed according to Ahler (1989) but were not collected. Six lithic flakes identified as flake tools in the field and collected were reclassified as lithic flakes after analysis and are included in the total of surface flakes. Three lithic cores, one bedrock metate, and one block metate were also recorded during surface investigations but were not collected. Subsurface testing yielded 11 flaked lithic tools, 3 cores, and 47 flakes.

Table 9.20. Feature 12 artifact summery, 5LA6108.

Artifact Type	Qty	Manufacturer	Artifact Type	Qty	Manufacturer
Metal			Square can w/slip on lid	2	One says "class" on side
Sanitary cans (all sizes)	267	Canco, Bogue-Wensley, Denver, Enfasons	Tobacco tins	4	1 Prince Albert
Evaporated/Condensed Milk can (lead solder > 4.5")	88		Pry out lid cans	3	
Evaporated/Condensed Milk can (lead solder <4.5")	104		Oval meat tins	1	
Unidentifiable can fragments	10		Cast iron stand base (poss shoe tree)	1	
Sanitary cans with center strip key	6		Gray enamelware ladle bowl (no handle)	1	
Coffee can w/lid	1	Wedding Breakfast	White w/black trim enamelware basin	1	
Coffee can w/no lid (1/2 lb.)	7		Barrel strap	1	
Coffee can (1 lb.)	2		Lantern part	1	
Coffee can lid only	1	Dwinell-Wright Co.	12 gauge centerfire shotgun cartridge	1	REM UMC ARROW No. 12
Large square can w/screw top (cooking oil?)	1		**Metal Total**	**536**	
Bail handle paint-like cans (1 gallon) 1 w/pry out lid	5	Canco	**Historic Ceramics**		
Bail handle paint-like cans (1 gallon)	4		Porcelain plate or saucer (1 w/design collected)	13	
Bail handle cans (small)	1		White utilityware w/gold floral design	2	
Rectangular meat tins	14		White utilityware, plain	31	
Cooking oil w/spout	6		Crockery, dark brown	12	
Bail handle (1/2 gallon) lard/paint cans	3		Whiteware, flowblue (1 collected)	4	

Artifact Type	Qty	Manufacturer
Historic Ceramics Total	**62**	
Bottle/Jar Glass		
Solarized	40	
Natural	8	
Natural, crown finish	1	
Aqua jar	54	
Aqua base	1	Mason
Blue green jar base	1	Patent Nov. 30th 1858
Complete clear glass bottle w/crown finish, 2 1/2 fl. oz. (poss. small milk bottle)	1	
Blue green jar fragments	18	1 w/ATLAS, MASON
Clear drinking glass	1	
Clear glass fragments	22	
Purple glass jar and goblet fragments	25	
Molded solarized glass	2	
Clear glass, bead finish	1	
Solarized glass, patent finish	1	
Brown bottle glass	6	
Milk glass, jar cap liner	3	
Milk glass, cold cream jar w/aluminum screw top lid	1	
Milk glass, jar cap liner	1	GENUINE BOYD CAP
Bottle/Jar Glass Total	**187**	
Other Glass		
Window glass	6	
Other Glass Total	**6**	

Flaked Lithic Artifacts

Biface One projectile point (5LA06108.000.248) was collected from the surface within the primary prehistoric artifact scatter (Figure 9.52). It is a small, expanding-stemmed projectile point made from yellow brown and red silicified wood, likely from the Palmer Divide 150 miles north of the site. It is nearly complete missing only the tip of one tang, which may have broken during the creation of the notch on that side. One of the shoulders may also have broken off at that time. The point is asymmetrical with one barbed shoulder and one abrupt shoulder. The abrupt shoulder may have been reworked. This artifact has a sharp tip, a triangular blade, slightly convex blade edges, a slightly expanding stem, a rounded tang, a straight base, and is bi-convex in cross-section.

A review of literature on the PCMS, including Anderson (1989), found no adequate matches for this artifact. The size is similar to the few specimens classified as Category P74 (Anderson 1989:206-207), but the overall morphology comparison is not a good match. In Anderson (1989:207), projectile points in Category P74 are tentatively dated from AD 650 to AD 950. Category P62 (Anderson 1989:193-196) is a better morphological comparison but Category P62 points are generally larger. Radiocarbon dates from two sites, 5LA5305 and 5LA5402, at the PCMS are associated with deposits containing Category P62 points and these yielded dates from AD 1030 to AD 1100. Based on other comparisons made in Anderson (1989:195) this point is placed in a much broader time span from AD 500 to AD 1400. The characteristics of this arrow point suggests that it occurs as early as the Developmental period (AD 100 to AD 1050), in to the Diversification period (AD 1050 to AD 1450) and perhaps as late as the Protohistoric period (AD 1450 to AD 1725) of the Late Prehistoric Stage (Zier and Kalasz 1999).

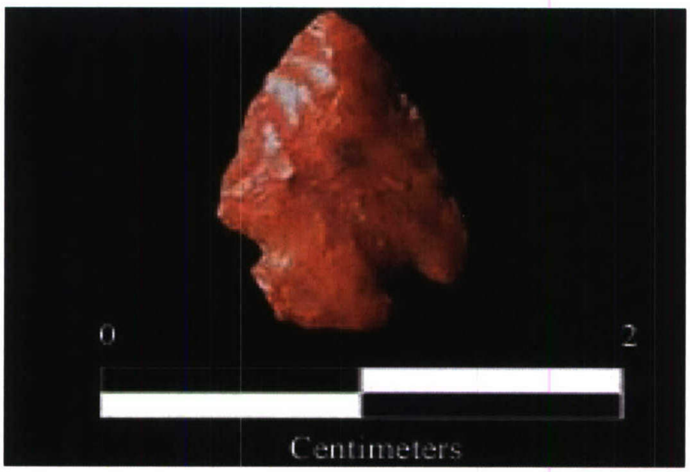


Figure 9.52. Projectile point, 5LA06108.000.248.

Cores Three dull gray quartzite cores were recorded on the surface. One of these had cortex present while two had no remaining cortex. Three additional cores were collected from subsurface testing. Two were recovered from Test Unit 2 and one was found in Test Unit 6. Both of these test units were excavated in order to expose Hearth 1, initially identified at the surface just east of the lithic scatter. All three collected

specimens were manufactured from chert and are small pieces that likely represent exhausted or nearly exhausted cores. Two show signs of use as a cutting or chopping tool as defined by Dean (1992). The first is composed of red and pink chert and has two striking platforms and more than three flake scars. Its edges have bimarginal use wear and unimarginal retouch. The second is manufactured from a very dark red chert and it also has two striking platforms and more than three flake scars. This artifact has unimarginal use wear. The third core also has two striking platforms and more than three flake scars but shows no evidence of use other than that of lithic reduction.

Flaked Lithic Tools Nine flaked lithic artifacts were identified as tools and collected from the surface, but six were reclassified as debitage after laboritory analysis. They were added to surface flake totals. All of the reclassified lithic flakes were composed of orthoquartzite which makes it difficult to differentiate use wear or retouch from natural breakage. The large grain size can look very much like a serrated edge. Of the three flake tools found on the surface, one has cortex present while two have no cortex. The flake tool retaining cortex is a large flake composed of dull gray quartzite with evidence of unimarginial use wear and unimarginal retouch. One of the surface tools with no cortex is made from a white orthoquartzite. The other is manufactured from gray chert with a few red inclusions. One of these flaked lithic tools has no use wear and unimarginal retouch. The other has bimarginal use wear and unimarginal retouch (Table 9.21).

The remaining 11 flaked lithic tools were recovered from subsurface testing. Ten are manufactured of chert. One is made from dark brown and black silicified wood. Two retain a small amount of cortex. Four of the tools were found in the vicinity of Hearth 1 (three in Test Unit 6, one in Test Unit 2). Of these, one has no use wear and unimarginal retouch, one has unimarginal use wear and no retouch, one has bimarginal use wear and unimarginal retouch, and one has unimarginal and bimarginal use wear and unimarginal retouch. One lithic tool was recovered from the initial excavation of Test Unit 22. This specimen has evidence of unimarginal use wear and unimarginal retouch. One small flaked lithic tool fragment showing bimarginal use wear and bimarginal retouch was found in Layer 2, Level 2 of Test Unit 1. The remaining five flaked lithic tools were found at or near the surface of the shallow test units placed within Feature 2, the historic domicile foundation. Four of these were found in Test Unit 24.One has no use wear evident but has unimarginal retouch, one has unimarginal use wear and retouch, one has bimarginal use wear and unimarginal retouch, and one has unimarginal use wear and no retouch. The final flaked lithic tool was recovered from Test Unit 23. It shows evidence of bimarginal use wear and unimarginal retouch. The utilization and retouch on most of the flaked lithic tools analyzed were ephemeral at best. None were heavily used or retouched, suggesting expedient use. All raw materials likely come from within the area covered by the PCMS.

Table 9.21. Flaked lithic tools, 5LA6108.

Catalog #	Provenience	Raw Material	Recovery Method	Cortex	Use Wear	Retouch	Type
5LA06108.000.031	surface	orthoquartzite	surface collection	absent	none	unimarginal	unknown
5LA06108.000.033	surface	chert	surface collection	absent	bimarginal	unimarginal	unknown
5LA06108.000.032	surface	quartzite	surface collection	present	unimarginal	unimarginal	unknown
5LA06108.000.072	Unit 1 Layer 2 Level 2	chert	1/16" control	absent	bimarginal	bimarginal	unknown
5LA06108.000.030	Unit 2 Layer 1 Level 1	chert	1/4"	present	unimarginal/bimarginal	unimarginal	unknown
5LA06108.000.029	Unit 6 Layer 1 Level 1	chert	1/4"	absent	unimarginal	none	unknown
5LA06108.000.028	Unit 6 Layer 1 Level 1	chert	1/4"	absent	bimarginal	unimarginal	unknown
5LA06108.000.073	Unit 6 Layer 2 Level 1	chert	1/16" control	absent	none	unimarginal	unknown
5LA06108.000.027	Unit 22 Layer 1 Level 1	chert	1/4"	absent	unimarginal	unimarginal	unknown
5LA06108.000.024	Unit 23 Layer 1 Level 1	chert	1/4"	absent	bimarginal	unimarginal	unknown
5LA06108.000.026	Unit 24 Layer 1 Level 1	chert	1/4"	absent	none	unimarginal	unknown
5LA06108.000.075	Unit 24 Layer 2 Level 1	chert	1/16" control	present	unimarginal	none	unknown
5LA06108.000.074	Unit 24 Layer 2 Level 1	silicified wood	1/16" control	absent	bimarginal	unimarginal	unknown
5LA06108.000.025	Unit 24 Layer 2 Level 1	chert	1/4"	absent	unimarginal	unimarginal	unknown

Non-tool Flaked Lithic Debitage A total of 171 non-tool lithic flakes were analyzed according to Ahler's size grade method. The surface inventory recorded 124 (72.5%) flakes, while 47 (27.5%) lithic flakes were collected from subsurface testing. Of those flakes collected through excavation, 11 were from Test Unit 6 and 15 from Test Unit 2. Both test units were associated with Hearth 1. Eight additional non-tool, flaked lithic artifacts were recovered from flotation of the fill from Hearth 1. Investigations surrounding Hearth 1 account for 76% of the subsurface total. The other 13 lithic flakes were collected at or near the surface of other test units. Three were recovered from Test Unit 24, four from Test Unit 1, three from Test Unit 4, one from Test Unit 9, one from Test Unit 13, and one from Test Unit 14. Complete results of the analysis of surface and subsurface non-tool flaked lithic debitage are shown in Table 9.22.

Of the lithic flakes analyzed, 66.6% are quartzite or orthoquartzite. An additional 26.9% are chert. Small amounts of local argillite and hornfels/basalt are also present in the lithic flake assemblage. The only material that may represent significant transport are three flakes (1.8% of total assemblage) of dendritic chert observed at the surface. It is possible that this fine dendritic chert may derive from the Hartville Uplift area in Wyoming or from non-local source locations in Colorado (Ahler 1996). Local materials found in the vicinity of the PCMS account for 98.2% of the total.

Lithic flakes larger than 1/2 in make up 62.6% of the total debitage. Slightly over a quarter of the assemblage are lithic flakes between 1/4 in - 1/2 in. Only a small percentage of lithic flakes (11.7%) fall into the smallest size category defined by Ahler (1989). A large percentage of the surface and subsurface inventory (71.3%) are simple flakes with two or fewer flake scars. Another 17.6% are shatter, predominantly from chert with a high amount of inclusions. These inclusions have imperfect breakage. A small amount of complex flakes (11.1%) are present in the assemblage; however, no bifacial thinning flakes are noted. Just over 80% of the lithic flakes found at this site have no cortex.

The high percentage of large-sized, simple flakes and shatter suggest early- to middle-stage lithic reduction. This, combined with the ephemeral nature of the flaked lithic tools collected, indicates an expedient use of flakes for various activities rather than a focus on late-stage lithic reduction or tool manufacture.

Groundstone

One bedrock metate and one non-portable block metate were found on the surface. The bedrock metate was found on a low, sandstone bedrock outcropping just north of the historic domicile (Feature 2). The heavily used, rectangular grinding surface is 76 cm x 30 cm and has no evidence of striations, pecking or polish. The block metate was found incorporated into the foundation of Feature 2. The flat, unshaped sandstone block measures 24 cm x 18 cm. The grinding surface has moderate smoothing but no evidence of polish, pecking or striations.

Table 9.22. Surface and Subsurface non-tool lithic debitage, 5LA6108

Material Type	Hornfels/Basalt				Dull Quartzite				Bright Orthoquartzite				Chert				Dendritic Chert				Chalcedony				Argillite				Unknown Igneous				Total	
	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	S	SS	No.	%	No.	%
Size Grade																																		
>1"	0	0	0		16	0	16		6	5	11		2	0	2		0	0	0		0	0	0		0	0	0		0	0	0		**29**	**17.0**
1/2"-1"	0	0	0		44	4	48		5	2	7		16	3	19		2	0	2		0	0	0		1	0	1		1	0	1		**78**	**45.6**
1/4"-1/2"	0	3	3		14	2	16		2	5	7		13	3	16		1	0	1		0	0	0		1	0	1		0	0	0		**44**	**25.7**
<1/4"	0	0	0		0	4	4		0	5	5		0	9	9		0	0	0		0	2	2		0	0	0		0	0	0		**20**	**11.7**
Total	**0**	**3**	**3**	**1.8**	**74**	**10**	**84**	**49.1**	**13**	**17**	**30**	**17.5**	**31**	**15**	**46**	**26.9**	**3**	**0**	**3**	**1.8**	**0**	**2**	**2**	**1.2**	**2**	**0**	**2**	**1.2**	**1**	**0**	**1**	**0.5**	**171**	**100**
Flake Type (Ahler 1997)																																		
Shatter	0	0	0		1	2	3		0	7	7		10	9	19		1	0	1		0	0	0		0	0	0		0	0	0		**30**	**17.6**
Simple	0	3	3		64	8	72		9	6	15		20	6	26		1	0	1		0	2	2		2	0	2		1	0	1		**122**	**71.3**
Complex	0	0	0		9	0	9		4	4	8		1	0	1		1	0	1		0	0	0		0	0	0		0	0	0		**19**	**11.1**
Bifacial Thinning	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		**0**	**0**
Total	**0**	**3**	**3**	**1.8**	**74**	**10**	**84**	**49.1**	**13**	**17**	**30**	**17.5**	**31**	**15**	**46**	**26.9**	**3**	**0**	**3**	**1.8**	**0**	**2**	**2**	**1.2**	**2**	**0**	**2**	**1.2**	**1**	**0**	**1**	**0.5**	**171**	**100**
Cortex																																		
Present	0	0	0		11	3	14		2	1	3		9	1	10		2	0	2		0	0	0		1	0	1		1	0	1		**31**	**18.1**
Absent	0	3	3		63	7	70		11	16	27		22	14	36		1	0	1		0	2	2		1	0	1		0	0	0		**140**	**81.9**
Total	**0**	**3**	**3**	**1.8**	**74**	**10**	**84**	**49.1**	**7**	**17**	**30**	**17.5**	**31**	**15**	**46**	**26.9**	**3**	**0**	**3**	**1.8**	**0**	**2**	**2**	**1.2**	**2**	**0**	**2**	**1.2**	**1**	**0**	**1**	**0.5**	**171**	**100**

Three additional groundstone artifacts were collected from the surface. One is a complete, lightly used mano made from a rough, flat sandstone cobble. This mano is ground on one surface. The other two are fragments of slab metates. Both are moderately to heavily worn on one side. One fragment has a spalled area at its center. No groundstone was recovered from subsurface testing.

Faunal Material

A total of 668 bulk bones were collected from subsurface testing at this site. The largest number, 414 bones or 62%, were recovered from the privy, Feature 5. Significant amounts of faunal materials were also collected from Feature 2 (16.3%), Hearth 1 (7.2%), and Feature 9 (5.7%). Bone was also found in Features 1, 7, 8, and 15 and in extramural Test Units 2, 6, and 16. A complete report of the analysis conducted on the faunal assemblage from this site can be found in Appendix I.

A variety of species including cottontail, badger, coyote, fish, horse, and rodent bone was identified from Feature 5. However, a large percentage of the bone present in this feature is believed to represent the remains of one striped skunk. Denning underneath structures is a common habit of striped skunks, making this individual's natural intrusion into this feature a distinct possibility. Although striped skunks were heavily trapped and skinned historically. Although there are no signature marks on the skeletal remains of this animal to indicate butchering, striped skunks were heavily trapped and skinned historically and it is possible that these bones were placed here by humans. Even though they are present in small numbers, the fish (1) and horse (2) remains are assumed to be cultural.

The next highest percentage of bone was collected from Test Unit 23, excavated in the northeast corner of Feature 2. No bone was collected from the test units excavated in the other "rooms" of Feature 2. All of the 109 bones recovered from this test unit were burned but none were identifiable. Burning was evident during the excavation of this test unit and previous survey identified both cast iron stove parts and a coal pile in the vicinity. These results support an interpretation that cooking took place in this portion of the domicile.

A considerably smaller amount of bone was found in Feature 9. Of the 38 bones collected, 13 belong to cottontail, and represent at least three individuals. Much of the cottontail bone is modified in ways suggestive of human modification. Considering the amount of kitchen-related artifacts, eggshell and faunal material found in Feature 9, this seems to be another likely area of either food preparation or of trash disposal. However, little evidence of burning, with the exception of two burned bones and a burned macrobotanical sample, was observed.

Faunal materials collected from Hearth 1 are largely unidentifiable and are notable primarily for their evidence of burning and for the bone bead that was recovered. Two other bones with evidence of bead manufacture were recovered from Hearth 1.

A single bone, the distal end of the right tibia of an elk, was recovered from a historic dugout, Feature 8 (Figure 9.53). Found just above bedrock, nearly 1.4 m below

the ground surface, this bone has a spiral fracture that may indicate the bone was broken for marrow extraction. The presence of this elk tibia may be an indication that large game was hunted for food by the site's historic inhabitants.

Figure 9.53. Elk tibia, 5LA06108.000.620.

Overall, the only clear evidence of hunting by the historic residents seen in the faunal assemblage is suggested by the high incidence of modified cottontail bone. The presence of the elk tibia is suggestive of larger game hunting, however, only seven additional bones (1%) were classified as large mammal bone. Considering that no other historic-era artifacts were recovered from the dugout, assigning the elk bone to the historic occupation is not certain. The presence of fish and horse at the site can be assumed to be cultural but, again, the small percentage of material makes it difficult to assign significance to either the diet or lifestyle of the site's historic residents.

Although little can be said about prehistoric subsistence based on the faunal assemblage collected, the presence of portions of three bone beads in the small area tested may attest to the significance of the *in situ* prehistoric component at this site.

Macrobotanical

In all, sixty-three macrobotanical samples were collected from the site. After a visual inspection, 14 samples were sent to High Plains Macrobotanical Services for further analysis. A complete report on this analysis is provided in Appendix II.

A total of 11 samples of macrobotanical/organic materials collected throughout Layer 2 of Test Unit 10 in Feature 5 were sent for testing. The results from Feature 5, which yielded large quantities of strawberry (*Fragaria virginiana*), raspberry (*Rubus idaeus*), and grape (*Vitis riparia*) seeds likely confirms the use of this feature as a privy. It is uncertain whether these fruits were eaten fresh, in jarred or canned jams/preserves or whether a combination of fresh and preserved fruits were consumed. It is possible that all of these plants could have grown wild in the vicinity of the PCMS. No jars or cans were observed which directly indicate that their contents included any of these fruits. The

non-botanical remains of eggshells and rabbit bones recovered from these samples may also be indicative of the types of foods consumed at this site. Cholla cactus (*Cylindropuntia imbricata*), juniper (*Juniperus monosperma*), five unknown seed species from the composite (Asteraceae) family and one charred berry fragment from an unknown species were also collected from Feature 5.

One unknown sample recovered from Feature 9 was sent for analysis. Although, it is suggested that the melted and fused grass silica found during this analysis could indicate a fire at the homestead because of its location in the wall of Feature 9 (Bach 2004), it is more likely that this burning is indicative of either trash burning or cooking activities taking place in or around this feature. No *in situ* burning was noted during the excavation of within Feature 9. Two burned bones were collected but not identified to genus.

The final two samples tested were recovered from Test Unit 2 and from Hearth 1, both associated with the prehistoric component at the site. Four charred, complete juniper seeds, 18 charred and fragmented juniper seeds, and one charred juniper berry fragment were identified. Juniper is known to have been used in a variety of ways that include food, medicinal uses, and for fuel. It remains possible that these seeds are the result of consumption of parts of the plants, were introduced as part of a fuel source (i.e. the use of juniper wood on a fire) or are simply intrusive due to their common occurrence in this area.

One seed was collected through floatation from the fill of Hearth 1. It was sent for further analysis. This sample was identified as an unburned juniper seed. This seed was not considered to be culturally significant due to its lack of charring (Bach 2004). Complete information on this analysis is located in Appendix II of this report.

Other Organic Material

Charcoal Charcoal was collected from test units when observed regardless of the temporal affiliation of the area being investigated. In all, 31 charcoal samples were collected from the site. Only one sample, taken from Hearth 1, was sent for analysis (Appendix III). As outlined in the discussion of the excavation of the hearth, this sample yielded a date range of AD 580 - AD 680.

Shell Of the twenty-six shell samples collected ten were classified as eggshell. Five of these came from Feature 9. Their size and their association with food-related artifacts including metal plates, pan lids, stove legs, and with cottontail bone suggest that they are related to historic subsistence. The five remaining eggshell samples were recovered from Feature 4 and Feature 14. These consist of extremely small fragments.

Gastropod Sixteen gastropod samples were recovered from the test unit sediments; however, none were sent for further analysis.

Mineral Samples

Five mineral samples were collected. Two were from Test Unit 22. Both of these samples exhibit a violent reaction to hydrochloric acid and are likely simply

conglomerations of calcium carbonate. One specimen is calcite and was collected from Feature 2. The remaining two samples include several small stones with very smooth surfaces and rounded edges. It was believed that some or all of these small stones could be gizzard stones. All were collected from Feature 9.

Unknown Materials

Seven samples were classified simply as unknown materials. Two may be burned glass, one has the appearance of decayed wood that retains the imprint of a textile much like a canvas cloth, and one has a tabular shape and may be burned tarpaper. No identification was attempted on the three remaining materials.

Conclusions

Site 5LA6108 is dominated by the ruins of a large early 20th century homestead/ranch. The substantial remaining features include: a residence; a barn; a cistern; a privy; a corral; a dugout; and two domestic dumps. Two of the structures display double-walled, dry-laid sandstone construction. Feature 7 was probably used for storage. It is an excellent example of double-walled architecture. The land was patented in 1922 by Henry Alfred Barnes. The initials "HB" also clearly associates the landowner of record with the land. The high incidence of sanitary cans, the higher percentage of aqua and clear glass and the RS Germany tableware all date the site to the early 20th century.

The amount of cultural material observed could have accumulated during a short, but intense, period of occupation like the time required to "prove up" the claim or it may have accumulated over longer but less intense periods such as seasonal occupations. Although the number of structures built at the site suggest a commitment to the land, the early 1900s were a time when many homesteaders came into the area to ranch or dry farm and quickly failed and moved on. The amount of sanitary cans, the bottle/jar glass, and the hinged and pry-out can lids indicate that the occupants had access to both perishable and less perishable food items. The lack of readily available water most likely influenced the occupation in some form or another. A cistern was found at the site and undoubtedly supplied most of the domestic water.

Feature 2 contained artifacts and ecofacts that are consistent with domestic activities. These include personal items, window glass, bone, and charcoal. Whether it was a bunkhouse or private residence is inconclusive. Certain items such as decorated ceramics and the remains of cold cream jars may indicate a feminine presence. No obvious child-related items were found. It is possible that the family did not live at the site year round. No evidence of a roof was found; therefore, it remains possible that this building provided seasonal living quarters. Feature 5 is the remains of a privy. Macrobotanical evidence and the amount and breath of the artifacts recovered here support this interpretation. The artifacts recovered from Feature 9 indicate that it was used for cooking or food preparation. Testing in Feature 1, the probable barn or outbuilding, leant no new information to its original function.

The geophysical survey revealed pathways and features not visible at the ground surface, further complementing the knowledge obtained from surface mapping and subsurface testing. Other anomalies show up in the data, but these would require further testing to determine their cause or function.

A substantial surface scatter of lithic material and groundstone are present at this site as well. Based on the number of flake tools and the absence of more formal tools, the prehistoric occupation seems to have included early- to middle-stage lithic reduction and the expedient use of flake tools. Evidence of some food processing is also present. The intact hearth attests to the presence of *in situ* prehistoric deposits. An AMS radiocarbon date on charcoal from the hearth yielded a date of AD 580 - AD 680, placing the site in the Developmental Period (AD 100 - AD 1050). Subjective dating for the projectile point places the site later in time, to at least AD 1050 - AD 1450 and possibly even later. It is possible there were two different uses of the site, perhaps first as a habitation site then, later, for hunting. It is more likely that the radiometric date and the projectile point are contemporaneous. This could indicate a wider time span for the projectile point. The remaining *in situ* deposits would provide additional information about the prehistoric occupation of the site.

Management Recommendation

Testing at 5LA6108 demonstrated that the site holds the potential to yield significant information about early 20th century ranching operations in southeastern Colorado. The amount and diversity of artifact classes and feature types suggest that this site represents the full range of activities associated with historic ranching. Two of the structures display double-walled, dry-laid sandstone construction, a rare occurrence in the area. Additional archival work and further excavation could provide more information on the use of such construction techniques. Other nearby sites ay also be associated with the activities of 5LA6108. These include a rockshelter habitation site (5LA7388) 100 m to the southwest. In this rockshelter was a bucket of unexploded dynamite (Owens et al. 2000). Another site with three rockshelters is also about 100 m from the site to the northwest. These shelters exhibited internal architecture but no time diagnostic artifacts. In the valley to the west is a large cable strung between the valley bottom and the top of the landform where 5LA6108 is located. Given the presence of the dynamite, architecture, and the cable, perhaps the occupants of 5LA6108 were engaged in some large-scale quarrying. This would lend some credence to the possibility that Feature 11 was used as a loading dock for shipping quarried material.

Testing of the prehistoric component yielded chronological and macrobotanical information from a buried feature that dates to the Late Developmental Period. The site is determined to have the potential to yield significant information about the prehistory history of the PCMS. It is therefore recommended as eligible for inclusion in the NRHP. Fencing of the site boundaries is recommended.

CHAPTER 10
SUMMARY AND CONCLUSIONS

Evaluative testing at four sites on the PCMS was conducted by Fort Lewis College during the summer of 2003. Surface mapping, artifact analysis and subsurface testing were implemented at each site. The subsurface testing included shovel testing, auger testing and test unit excavation. Archival research and geophysical surveys were conducted for the two historic homesteads. Laboratory analysis was conducted on the material culture remains. Results of these various endeavors are briefly summarized below.

The first site tested was 5LA3333, a multicomponent historic and prehistoric site. This site is dominated by the ruins of an early 20th century homestead. The land was patented in 1922 by Harold Sater. The Sater family was part of the early homesteading era of southeastern Colorado. The site was originally recorded in 1984 by Denver University. Based on the present architecture and artifacts, the site was described as a ranching operation of Euro-american/Hispanic origin. The historic component consists of three sandstone foundations, a partially standing sandstone structure, a circular depression and a possible privy. The site form also mentioned a sparse prehistoric artifact scatter including bedrock metates.

Mapping at the site during the testing phase expanded the original site area to about 2.6 acres. This included the area around the spring. Fort Lewis College identified and mapped an additional historic foundation and six more features (two cairns, two bedrock metates, a rock art panel and a possible prehistoric wall alignment). Both prehistoric and historic artifacts were mapped and analyzed in the field. Many of the artifacts were located in deflation pockets within bedrock exposures and along the alluvial terrace adjacent to the drainage. Three pieces of modified glass and four lithic tools were collected from the surface. Twenty-two flakes and the bedrock metates were mapped. The flakes were analyzed and left in the field. Electrical resistance and gradiometer surveys were conducted over five 20 x 20 meter grids. A total of 4 auger test probes, 21 shovel test pits and 7 test units were excavated. Six test units were placed to examine the extent of subsurface artifacts both inside and outside of the identified features and structures. A seventh test unit was placed in a magnetic anomaly discovered during the geophysical survey.

Testing recovered a variety of historic artifacts included glass, historic ceramics, nails, horseshoe nails, miscellaneous metal artifacts and tarpaper/roofing material. Except for two pieces of solarized bottle glass, no artifacts date earlier than the 1922 patent date for the land. The prehistoric artifacts were limited to 1 projectile point, 2 flake tools, 30 pieces of debitage, 2 metate fragments and a mano. Projectile point comparisons with similar points from the area indicate that the prehistoric component dates to the Late Archaic Period, circa 1500 B.C. - 1000 B.C.

Structure 4 provides some indication that it may have been used as a domestic

dwelling; however, there is little evidence for long-term use. It remains unclear how the site was historically used. Both historic and prehistoric occupations were likely related to the presence of the nearby spring. Prehistoric artifacts are sparse but do indicate that at least some food preparation, lithic reduction and possible hunting took place at the site, but this to seems temporary.

Our subsurface investigations yielded shallow cultural deposits; erosion and bioturbation have extensively damaged the integrity of both temporal components. The lack of substantial subsurface deposits and the deteriorated condition of the structures indicate a lack of contextual integrity. The level of testing conducted at this site is believed to be sufficient to determine that the site does not hold the potential to yield additional information significant to the history or prehistory of the PCMS.

Site 5LA4417 is a multicomponent site with several prehistoric features and a historic telephone line. The line is marked by sandstone boulders and juniper posts. The prehistoric component was originally recorded in 1987 by Larson-Tibesar Associates and Centennial Archaeology. Several features including three contiguous rock walls and an eroding midden were visible on the surface at this time. They inferred that the site was occupied between A.D. 200 and A.D. 1400. The site was reevaluated by New Mexico State University in 2003 and an additional contiguous rock wall feature was recorded. Except for Feature 3, a metate, all previous recorded features were relocated.

Mapping during the testing phase expanded the site boundary to about 8.7 acres. Previous undocumented features included a historic telephone line, a wooden post with associated sandstone concentration, a concentration of culturally piled rocks, a small soil stain and a windbreak/hunting blind. Many of the surface artifacts had been previously collected by Larson-Tibesar. Fort Lewis College collected three projectile points, four pieces of groundstone and seven flake tools from the surface. An additional 88 flakes, 4 non-portable groundstone fragments and a core were analyzed and left in the field.

Fourteen shovel test pits and eight test units were excavated. The test units were in areas identified as features to test for intact subsurface deposits. A thermal feature was found in one of the test units. In the eastern portion of the site where no architectural features were identified shovel test pits were excavated to test for the potential of deeply buried artifacts on cultural horizons. Artifacts from the subsurface investigations included1 projectile point, 5 flake tools,3 groundstone fragments, and 40 flakes. Over two hundred pieces of bulk bone and a bone bead were recovered from the subsurface as well. Less than 20% of the faunal assemblage was identifiable in some manner.

Site 5LA4417 is comprised of prehistoric and historic features and artifacts. The historic component is limited to a line of sandstone boulders and juniper posts likely delineating a historic telephone line. A glass insulator found on the surface has a manufacturing date between 1914 and the 1950s. It is suspected, however, that the line

probably dates to the 1940s at the earliest.

Prehistoric architectural features along with the variety of artifacts found at this site, suggest that this was the location of at least seasonal shelter with some hunting, lithic reduction and food processing. The artifacts collected during testing provide few additional clues to the function of the features and structures. The high percentage of burned bone and fire-cracked rock in Feature 1 may indicate that its original function was a midden or roasting pit. A charcoal sample from the midden yielded a 2 sigma calibrated calendar date of A.D. 1020 - A.D. 1220. Another charcoal sample was collected from a subsurface thermal feature. This wood charcoal sample dated to A.D. 990 - A.D. 1230. Based on the presence of six projectile points fragments, the site was originally dated to A.D. 200 - A.D. 1400. An additional point, collected by FLC in 2003, suggests an occupation date ranging from A.D. 800 - A.D. 1750 but possibly as early as 200 B.C. These dates place the site firmly in the Late Prehistoric stage (Zier and Kalasz 1999).

Test unit excavations failed to demonstrate the presence of significant subsurface cultural deposits. The sediments were shallow over all of the tested areas and artifacts recovered from subsurface testing were minimal. The level of testing conducted at this site is believed to be sufficient to determine that the site does not hold the potential to yield additional information significant to the prehistory of the PCMS.

Site 5LA5612 consists of a large but sparse scatter of lithics and bedrock metates. Although several hearth features were noted when the site was originally recorded, our investigations did not produce any evidence of these features. The site was originally recorded in 1983 by Denver University. They recorded a historic fence line, a rock shelter, several hearths, several bedrock metates and a natural water catchment feature. They identified a sparse lithic scatter along the bedrock and a more dense scatter near the drainage. A projectile point was collected by Denver University and it was placed in a broad time frame of 3000 B.C. to 300 B.C. In 2001 David Kuehn Consulting along with New Mexico State University, carried out test unit excavations in previously impacted areas. Information from this testing phase was not available at the time of this publication.

Mapping by Fort Lewis College decreased the site size from 10.5 to 2.8 acres. The bedrock metates and the rock shelter were the only features located from the original site recording. Sixteen bedrock metates were identified and mapped, one hundred and two flaked lithic artifacts and five cores were analyzed in the field. A flake tool fragment, a projectile point, a ground stone fragment and a manuport were collected. A historic inscription was noted along the sandstone escarpment.

Two test units and forty-six shovel test pits were excavated at the site. Most of these were placed in the drainage area to test for hearth features that were noted during the original survey. These features were not relocated. Sixteen flakes were found during excavation. Charcoal collected from sequential layers in one test unit along with a diagnostic artifact

from the surface, indicate the possibility of two prehistoric occupations. The dates were on wood charcoal that could not be directly linked to any features or cultural surfaces. The calibrated radiocarbon dates are 790 B.C. to 410 B.C. and A.D. 770 to A.D. 980. These date ranges fall into the Late Archaic Period of the Archaic Stage and the Developmental Period of the Late Prehistoric Stage (Zier and Kalasz 1999). The projectile point collected by Fort Lewis College was dated by comparisons to A.D. 500 to A.D. 1400. The bedrock metates along with the lithic artifacts are evidence for food preparation, lithic reduction and hunting.

Erosion could account for the presence of artifacts in the drainage and for the loss of cultural materials and features observed since 1983. Bioturbation from plants and animals might explain the presence of the few artifacts found in the deeper strata. These artifacts, if they do originate from cultural deposits, will likely not be impacted by military activities. Shallow sediments extend over the majority of this site, although sediments in the drainage area are deep. The level of testing conducted at this site is believed to be sufficient to determine that the site does not hold the potential to yield additional information significant to the prehistory of the PCMS.

Site 5LA6108 is dominated by the ruins of a large early 20th century homestead/ranch. The land was patented in 1922 by Henry Alfred Barnes. Nine features were identified and recorded in 1993 by WCRM, Inc. as part of a historical archeology survey. These features included: two rock structures, one stone foundation, one corral, two potential dugouts, two possible privies and one possible animal pen. The site was described as a sheep-ranching operation dating from the 1910s to 1920s. A light prehistoric artifact scatter was noted but was not fully documented.

Mapping by Fort Lewis College increased the site area from 2.9 acres to 5.9 acres. Fort Lewis College relocated the originally recorded features. Seven additional features and the unrecorded prehistoric component were also recorded. The five new historic features include a quarry or loading dock, two trash deposits, a possible tent platform and one cistern. A variety of historic artifacts were noted on the surface but only two ceramics were collected for dating purposes. Surface investigations included the examination of historic artifacts in the two trash deposits. Two prehistoric stone wall alignments were mapped within the prehistoric artifact concentration. One hundred eighteen flakes, three cores, a bedrock metate and a block metate were analyzed in the field. A projectile point, three flake tools and three portable groundstone fragments were mapped and collected. Electrical resistance and gradiometer surveys were conducted over twenty-three 20 m x 20 m grids.

Testing at the site included 24 test units and 19 auger test pits. The majority of the test units were placed in features/structures to try and determine their function. The auger tests were used in two ways; augers were used to investigate a resistance anomaly found during the geophysical survey, while additional auger tests were placed in the bottom of some test unit to explore the extent of subsurface deposits after what were believed to be culturally sterile sediments had been reached. A wide variety of artifacts were recovered from

the test units. Glass, metal and ceramics were the three main categories of historic artifacts. Testing in the prehistoric component exposed a hearth feature with a sandstone deflector. Prehistoric artifacts recovered from testing included 47 flakes, 11 flake tools and 3 cores.

Several substantial historic architectural features suggest the full range of activities associated with historic ranching. Two of the structures display double-walled sandstone construction, a rare occurrence in the area. The high incidence of sanitary cans, the higher percentage of aqua and clear glass and the RS Germany tableware all date the site to the early 20th century. The initials "HB" on the cistern cover further associate the landowner of record with the ranch. The geophysical survey revealed pathways and possible features not visible at the ground surface, further complementing the knowledge obtained from surface mapping and subsurface testing.

A seasonal or temporary prehistoric habitation component was also tested and it produced buried artifacts, a hearth and a cultural horizon. An AMS radiocarbon date on charcoal from the hearth dates this component to A.D. 580 to A.D. 680 placing the site in the Developmental Period. Subjective dating for the projectile point places the site later in time, to at least A.D. 1050 - A.D.1450 and possibly even later. It is possible there were two different uses of the site, perhaps first as a habitation site then, later, for hunting. It is more likely that the radiometric date and the projectile point are contemporaneous. This would indicate a wider time span for the projectile point.

Testing at this site demonstrated that the site holds the potential to yield significant information about early 20th century ranching operations in southeastern Colorado and on the prehistoric occupation of the Late Developmental Period. The site is therefore recommended as potentially eligible for nomination to the NRHP. Fencing of the site boundaries is recommended.

REFERENCES CITED

Ahler, S. A.

1970 Projectile Point Form and Function at Rodgers Shelter, Missouri. *Missouri Archaeological Society Research Series* 8.

1989 Mass Analysis of Flaking Debris: Studying the Forest Rather than the Tree. In *Alternative Approaches to Lithic Analysis*, ed. by D. O. Henry and G. H. Odell, pp.85-118. Archaeological papers of the American Anthropological Association No.1.

1996 Redefinition of Chipped Stone Lithic Raw Material Types. In *Archaeological Investigations at Ceramic Stage Sites in the Pinon Canyon Maneuver Site, Colorado*, by L. L. Loendorf, J. L. Borchert, and D. G. Klinner. Pp. 339-355, Contribution No. 308. Department of Anthropology, University of North Dakota, Grand Forks.

Ahler, S. A. (ed.)

2002 *Fieldwork, Geology, and Early Component Research During 2001-2002 at the Barnes Site, 5LA9187, Pinon Canyon Maneuver Site, Colorado.* Fort Carson Cultural Resource Management Series Contribution No.11. Fort Carson, CO.

Ahler, S. A. and M. Smail

1999 *Stone Tools and Flaking Debris.* In Research Contribution No.13 of PaleoCultural Research Group, Flagstaff, AZ.

Alexander, R., J. Hartley and T. Babcock

1982 A settlement survey of the Fort Carson Military Reservation (3 vols.). MS on file, Grand River Consultants, Grand Junction, CO.

Anderson, J. L.

1988 Prehistoric overview. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado* (vol. II). Ed. W. Andrefsky, Jr., pp. VII-1-30. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-7-B054 (amended 1990).

1989 Projectile Points. In *Temporal Assessment of Diagnostic Materials from the Pinon Canyon Maneuver Site*. Memoirs of the Colorado Archaeological Society No. 4, Denver.

Andrefsky, W. Jr. (ed.)

1990 *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado.* MS on file, National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-7-B054.

1994 Raw-material Availability and the Organization of Technology. *American Antiquity* 59: 21-34.

Andrefsky, W. Jr., M. Bender, J. Benko and J. Michaelson

1990 Test Excavations in the Pinon Canyon Maneuver Site, Southeastern Colorado. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-7-B054.

Andrefsky, W. Jr. and P. H. Sanders (eds.)

1987 *Preliminary Report. 1987 Cultural Resources Survey Management in Areas D and E, U. S. Army Pinon Canyon Maneuver Site, Las Animas County, Colorado.* MS on file, National Park Service, Rocky Mountain Regional Office, Interagency Archeological Services, Denver.

Andrefsky W. and C. Zier

1988 Prehistoric Research Design. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado* (vol. II). Ed. W. Andrefsky, Jr., pp. VIII-1-37. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-7-B054 (amended 1990).

Angulski, D.

1984 Colorado State Site Form, 5LA3421.

Angulski, D. and R. Carillo

1984 Colorado State Site Form, 5LA3333.

Antevs, E.

1955 Geologic-climatic dating in the West. *American Antiquity* 20:317-35.

Arthur, G.

1975 An Introduction to the Ecology of Early Historic Bison Hunting among the Northern Plains Indians. Ph.D. dissertation, University of Calgary.

Athearn, F. J.

1985 Land of Contrast. A History of Southeast Colorado. Cultural Resource Series 17. Bureau of Land Management, Denver.

Bach, D. R.

2004 *Macrofloral and Gastropod Identification from Three Archaeological Sites in Southeastern Colorado: 5LA3333, 5LA5612 and 5LA6108.* High Plains Macrobotanical Services. Submitted to Mona Charles, Fort Lewis College, Department of Anthropology, Report No. HPMS-22-2004. Copies available from High Plains Macrobotanical Services, Laramie.

Bamforth, D. B.

1988 *Ecology and Human Organization on the Great Plains.* Plenum Press, New York.

Barnes, F. C.

1971 *Cartridges of the World.* Digest Books, Inc., Northfield, IL.

Baugh, T. and J. Ericson (eds.)

1994 *Prehistoric Exchange Systems in North America.* Plenum Press, New York.

Bearse, R.

1966 *Centerfire American Rifle Cartridge 1892-1963.* A. S. Barnes and Co. Inc., South Brunswick, London.

Benedict, J. B. and B. Olson

1978 *The Mount Albion Complex. A Study of Prehistoric Man and the Altithermal.* Research Report 1. Center for Mountain Archaeology, Ward, CO.

Berge, D. L.

1980 *Simpson Springs Station: historical archaeology in western Utah, 1974-1975.* Bureau of Land Management, Utah State Office, Salt Lake City.

Bevan, B. W.

1992 *Some Resistivity Measurements at the Brown Sheep Camp.* MS on file, National Park Service, Rocky Mountain Regional Office, Interagency Archeological Services, Denver.

1998 *Geophysical Exploration for Archaeology: An Introduction to Geophysical Exploration.* Midwest Archeological Center Special Report No. 1. Lincoln, NE.

Binford, L. R.

1980 Willow smoke and dog tails: hunter-gatherer settlement systems and archaeological site formation. *American Antiquity* 45: 4-20.

Buchner, A. P.
1979 *Cultural Responses to Altithermal (Atlantic) Climate along the Eastern Margins of the North American Grasslands: 5500-3000 BC.* Ph.D. dissertation, University of Calgary.

Butler, W. B.
1986 Taxonomy in Northeastern Colorado Prehistory. Ph.D. dissertation, University of Missouri.

Calabrese, F. A.
1972 Cross Ranch: A Study of Variability in a Stable Cultural Tradition. *Plains Anthropologist, Memoir* 9.

Campbell, R. G.
1969 *Prehistoric Panhandle Culture on the Chaquaqua Plateau, Southeastern Colorado*. Ph.D. dissertation, University of Colorado.

1976 The Panhandle Aspect of the Chaquaqua Plateau. *Graduate Studies of Texas Technical University* 11, Lubbock.

Carrillo, R.
1988a Historic Overview. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado* (vol. III). Ed. W. Andrefsky, Jr., pp. XVIII-1-45. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-7-B054 (amended 1990).

1988b Historical Archaeology Research Design. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado* (vol. III). Ed. W. Andrefsky, Jr., pp. XIX-1-42. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-7-B054 (amended 1990).

1988c Historic Settlement and Use of the Pinon Canyon Maneuver Site. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado* (vol. III). Ed. W. Andrefsky, Jr., pp. XXIII-1-24. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-7-B054 (amended 1990).

1990 Historic Overview. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado* (vol. III). Ed. by W. Andrefsky, Jr., pp. XVIII-1-45. MS on file, National Park Service, Rocky Mountain Regional Office, Denver.

Carrillo, R. F., C. C. Chambellan and T. J. Lennon

1996 *Summary Report of a Historical Archaeology Survey Conducted at the Pinon Canyon Maneuver Site, Las Animas County, Colorado During the Summer of 1993.* MS on file, National Park Service, Rocky Mountain Regional Office, Interagency Archeological Services, Denver.

Carrillo R. and S. Kalasz

1988 Historical Feature and Site Type Analysis. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado* (vol. III). Ed. W. Andrefsky, Jr., pp. XX-1-45. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-7-B054 (amended 1990).

Carrillo, R.

1984 Historic site form, 5LA3333.

Carrillo, R. F., S. F. Mehls and D. Hardesty

1993 *Historical Archaeology at Lockwood, a 19th Century Stage Station (5LA5454), Las Animas County, Colorado: A Data Recovery.* MS on file, National Park Service, Rocky Mountain Regional Office, Interagency Archeological Services, Denver.

Cassells, E. S.

1983 *The Archaeology of Colorado.* Johnson Books, Boulder.

1997 *The Archaeology of Colorado.* 2nd Edition. Johnson Books, Boulder.

Chase, H.

1949 *Colorado Z:8:1. Report.* MS on file, Office of Archaeology and Historic Preservation, Colorado Historical Society, Denver.

Charles, M., R. Nathan and P. Duke

1996 *Evaluative Testing of Eight Archaeological Sites in the Pinon Canyon Maneuver Site, Las Animas County, Colorado.* Fort Lewis College, Durango, CO.

Charles, M., T. Baker, C. Markussen, R. Nathan and P. Duke

2005 *Evaluative Testing of 5LA3421: A Multicomponent Prehistoric and Historic Site, Pinon Canyon Maneuver Site, Las Animas County, Colorado.* Fort Lewis College, Durango, CO.

Chidley, M.
2003 Colorado State Site Reevaluation Form, 5LA4417.

Chomko, S. A., S. DeVore and L. Loendorf
1990 Apishapa Phase Research at the Pinon Canyon Maneuver Site, Southeastern Colorado. Paper presented at the 48th Plains Conference, Oklahoma City.

Chomko, S. A., L. A. Gange, and T. Roesgen
1992 *Our Past, Our Future: Cultural Resources of the Pinon Canyon Maneuver Site*. 25 minute videotape. University of North Dakota. National Park Service, Rocky Mountain Regional Office, Interagency Archeological Services, Denver.

Church, M. C.
2001 *Homesteads on the Purgatoire: Frontiers of Culture Contact in 19th Century Colorado*. Ph.D. dissertation, Department of American Civilization, University of Pennsylvania.

2002 The grant and the grid: Homestead landscapes in the late nineteenth-century borderlands of southern Colorado. In *Journal of Social Archaeology* 2(2): 220-244.

Church, M. C. and P. Cowen
2005 *Evaluative Testing of the Bent Canyon Stage Station on the Pinon Canyon Maneuver Site, Las Animas County, Colorado*. Prepared for National Park Service, Midwest Archeological Center, Lincoln, Nebraska and Department of the Army, Fort Carson Command, Directorate of Environmental Compliance and Management, Fort Carson, Colorado, by Department of Anthropology, University of Colorado at Colorado Springs, Colorado Springs.

Clark, A.
1990 *Seeing Beneath the Soil prospecting methods in archaeology*. B.T. Batsford Ltd., London.

1996 *Seeing Beneath the Soil prospecting methods in archaeology*. 2nd Edition. B.T. Batsford Ltd., London.

2003 *Seeing Beneath the Soil prospecting methods in archaeology*. Biddles Short Run Books, King's Lynn.

Clifton, R. T.

1970 *Barbs, Prongs, Points, Prickers and Stickers.* University of Oklahoma Press, Norman.

Clint, D. K.

1976 *Colorado Historical Bottles and etc., 1859-1915.* Johnson Publishing Company, Boulder.

Cole, S. J.

1984 *Rock Art Styles of Pinon Canyon Area.* Paper presented at the annual meeting of the Colorado Council of Professional Archaeologists, Boulder.

1985 *Rock Art of the Pinon Canyon Archaeological Project and Southeastern Colorado.* Draft Report. University of Denver, Contribution No. 8 of No. LA.DA.R12 on file, Colorado Historical Society, Office of Archaeology and Historic Preservation, Denver.

Dean, J. C.

1992 *Guidelines to Required Procedures for Archaeological Field and Laboratory Work at Pinon Canyon Maneuver Site Las Animas County, Colorado.* MS submitted to the U.S. Army by Department of Anthropology, University of North Dakota.

De Vore, S. L.

1993 *An Application of Geophysical Techniques to Historic Archeological Sites 5LA5824 and 5LA5844: The National Park Service's Cultural Resource Training Initiative.* Paper presented at the 26th Conference on Historical and Underwater Archaeology, Kansas City, MI.

2002 Appendix A. Report of the Geophysical Investigations at Site 5LA9187, Pinon Canyon Maneuver Site, Las Animas County, Colorado. In *Fieldwork, Geology, and Early Component Research During 2001-2002 at the Barnes Site, 4LA9187, Pinon Canyon Maneuver Site, Colorado*, ed. S. A. Ahler. Fort Carson Cultural Resource Management Series Contribution No. 11. Fort Carson, CO.

Dick, H. W.

1963 *Preliminary Report: Trinidad Reservoir, Las Animas County, Colorado.* MS on file, Midwest Archeological Center, National Park Service, Lincoln, NE.

Drass, R. R.

1998 The Southern Plains Villagers. In *Archaeology of the Great Plains*, ed. W. R. Wood, pp. 415-455. University Press of Kansas, Lawrence.

Duke, P.
1978 *The Crowsnest Pass: A Locational Analysis.* M.A. thesis, University of Calgary.

1991 *Points in Time: Structure and Event in a Late Northern Plains Hunting Society.* University Press of Colorado, Niwot.

Duke, P. and M. Wilson
1994 Cultures of the Mountains and Plains: from the Selkirk Mountains to the Bitterroot Range. In *Plains Indians A.D. 500-1500.* Ed. K. Schlesier, pp. 56-70. University of Oklahoma Press, Norman.

1995a Introduction. Postprocessualism and Plains Archaeology. In *Beyond Subsistence: Plains Archaeology and the Postprocessual Critique.* Ed. P. Duke and M. Wilson, pp. 1-27. University of Alabama Press, Tuscaloosa.

1995b *Beyond Subsistence: Plains Archaeology and the Postprocessual Critique.* University of Alabama Press, Tuscaloosa.

Eddy, F. W., P. Friedman, R. Oberlin, T. Farmer, D. Dahms, J. Reining and B. Leichtman
1982 The Cultural Resource Inventory of the John Martin Dam and Reservoir. MS on file, Corps of Engineers, Albuquerque.

Eddy, F. W., R. Oberlin and T. R. Farmer
1984 Spatial Analysis of Archaeological Data at the John Martin Dam and Reservoir, Southeastern Colorado. *Plains Anthropologist* 29 (103):25-40.

Eighmy, J.
1984 Colorado Plains Prehistoric Context for Management of Prehistoric Resources of the Colorado Plains. Office of Archaeology and Historic Preservation, Colorado Historical Society, Denver.

Fike, R. E.
1987 *The Bottle Book: A Comprehensive Guide to Historic, Embossed Medicine Bottles*. Peregrine Smith Books, Salt Lake City.

Forbes, J. D.
1960 *Apache, Navajo and Spaniard.* University of Oklahoma Press, Norman.

Friedman, P. D.
1985 Final Report of History and Oral History Studies of the Fort Carson Pinon Canyon Maneuver Area, Las Animas County, Colorado. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-3-A066.

Frison, G. C.
1973 The Plains. In *The Development of North American Archaeology*. Ed. J. Fitting, pp. 151-184. Doubleday Books, Garden City, New York.

1978 *Prehistoric Hunters of the High Plains*. Academic Press, New York.

Frison, G. C., J. E. Francis and J. C. Miller
1991 *Prehistoric Hunters of the High Plains*. 2nd edition. Academic Press, New York.

Gaston, M. F.
1995 *Collector's Encyclopedia of R.S. Prussia: Identification and Values*. Collector Books, Paducah, KY.

1997 *R.S. Prussia: The Early Years*. Schiffer Publishing Ltd., Atglen, PA.

1999 *R.S. Prussia Popular Lines: Identification and Value Guide*. Collector Books, Paducah, KY.

Gillio, D., F. Levin and D. Scott
1980 Some Common Artifacts Found at Historical Sites. *Cultural Resource Report* 31. USDA Forest Service, Southwestern Region, Albuquerque.

Grayson, D. K.
1984 *Quantitative Zooarchaeology*. Academic Press, New York.

Gunnerson, J. H.
1987 *Archaeology of the High Plains*. Bureau of Land Management, Denver.

1989 Apishapa Canyon Archeology: Excavations at the Cramer, Snakes Blakeslee and Nearby Sites. *Reprints in Anthropology* 41. J&L Reprint Co., Lincoln, NE.

Guthrie, M. R., T. Pozorski and T. Fulgham
1984 Pinon Canyon Archaeological Project: First Season. In, *Papers of the Philmont Conference on the Archaeology of Northeastern New Mexico*, ed. by C. J. Condie. New Mexico Archaeological Council Proceedings 6(1):313-346.

Hammond, G. P. and A. Rey (eds.)
1940 *Narratives of the Coronado Expedition, 1540-1542*. University of New Mexico Press, Albuquerque.

Hardesty, D. L.
1980 Historic sites archaeology on the western American frontier. Theoretical perspectives and research problems. *North American Archaeologist* 2.

Hardesty, D. L., R. F. Carrillo, S. F. Mehls, J. L. Anderson and T. J. Lennon
1995 *Data Recovery Report of Lockwood Stage Station at the Pinon Canyon Maneuver Site, Las Animas County, Colorado* (2 vols.). MS on file, National Park Service, Rocky Mountain Regional Office, Interagency Archeological Services, Denver.

Harper, H. R.
1996 *Souls of the Purgatoire*. Video. Produced by the Directorate of Environmental Compliance and Management, Fort Carson, CO.

Hayden, B.
1982 Interaction Parameters and the Demise of Paleo-Indian Craftsmanship. *Plains Anthropologist* 27:109-123.

Haynes, R. and B. Bastian
1987 *Historical Architectural Evaluation of 49 sites in the Pinon Canyon Maneuver Sites, Las Animas County, Colorado*. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-5-A040.

Hyde, G.
1976 *Indians of the High Plains*. University of Oklahoma Press, Norman. (1st Ed. 1959).

Hunt, W. J. Jr.
1999 *Archaeological Inventory in the Vicinity of Brown's Sheep Camp (5LA5824), a Multi-component District in the U. S. Army Pinon Canyon Maneuver Site, Las Animas County, Colorado*. MS on file, Fort Carson, CO.

Intermountain Antiquities Computer Systems Guide (IMACS)
1992 Antiquities information. Electronic document, http://www.anthro.utah.edu/imacs.html, accessed December 2004.

Ireland, S. K.
1968 Five Apishapa Focus Sites in the Arkansas Valley, Colorado. M.A. thesis, University of Denver.

Jochim, M. A.
1976 *Hunter-Gatherer Subsistence and Settlement. A Predictive Model.* Academic Press, New York.

Johnson, E. (ed.)
1988 *Lubbock Lake. Late Quaternary Studies on the Southern High Plains.* Texas A & M University Press, College Station.

Johnson, R. B.
1969 Geologic Map of the Trinidad Quadrangle, South-central Colorado: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-558, scale 1:250,000.

Jones, D. G., M. Williams, K. Stemmler, M. H. McGrath and E. C. Winstead
1998 *Ethnohistoric and Ethnographic Information Related to the Fort Carson Military Reservation and Pinon Canyon Maneuver Site in Colorado.* Department of the Army, St. Louis.

Kehoe, T.
1966 The Small Side-notched System of the Northern Plains. *American Antiquity* 31: 827-841.

Kelly, R. L. and L. Todd
1988 Coming into the Country: Early Paleoindian Hunting and Mobility. *American Antiquity* 53:231-244.

Kempton, K. and M. Baber
1988 Historic Artifact Analysis. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado* (vol. III). Ed. W. Andrefsky, Jr., pp. XXI-1-29. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-7-B054 (amended 1990).

Kempton, K. and R. Carrillo

1988 Historic Site Type Synthesis. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado* (vol. III). Ed. W. Andrefsky, Jr., pp. XXII-1-65. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-7-B054 (amended 1990).

Kingsbury, L. A. and L. H. Gabel

1983 Eastern Apache Campsites in Southeastern Colorado: An Hypothesis. In *From Microcosm to Macrocosm: Advances in Tipi Ring Investigation and Interpretation*, ed. by L. B. Davis, pp. 319-325. Plains Anthropologist Memoir 19.

Klein, R. and K. Cruz-Uribe

1984 *The Analysis of Animal Bones from Archaeological Sites*. The University of Chicago Press, Chicago.

Kordecki, C. And L. L. Loendorf

1988 *The Pinon Canyon Maneuver Site Rock Art Project: Quality Control Project. University of North Dakota, Grant Forks, North Dakota.* MS on file, National Park Service, Rocky Mountain Regional Office, Interagency Archeological Services, Denver.

Kuehn, D.

2002 Draft of site form and map, 5LA3421.

Kvamme, K.

1984 Models of Prehistoric Site Location near Pinon Canyon, Colorado. In *Papers of the Philmont Conference on the Archaeology of Northeastern New Mexico*. Ed. C. J. Condie, pp. 347-370. Proceedings of the New Mexico Archaeological Council 6.

1992 A Predictive Site Location Model on the High Plains: An Example with an Independent Test. *Plains Anthropologist* 37: 19-40.

2001 Current Practices in Archaeogeophysics. In *Earth Sciences and Archaeology*. Ed. by P. Goldberg, V. T. Holliday, and C. R. Ferring. Kluwer Academic/Plenum Publishers.

Kvamme, K., R. Carrillo and S. Mehls.

1985 Proposed Prehistoric Sampling Design for Pinon Canyon Regions D and E. In *A Management Plan for the Fort Carson-Pinon Canyon Maneuver Site*. Ed. M. Guthrie, pp. 361-385. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-3-A021.

Lewis, O.
1942 The Effects of White Contact upon Blackfoot Culture, with Special Reference to the Fur Trade. *American Ethnological Society Monograph* 6.

Lief, A.
1965 *A Close-Up of Closures: History and Progress*. Glass Containers Manufacturers Institute, New York.

Lintz, C.
1978 Architecture and Radiocarbon Dating of the Antelope Creek Focus: A Test of Campbell's Model. In *Plains Anthropologist* 23:319-328.

1984 *Architecture and Community Variability within the Antelope Creek Phase of the Texas Panhandle*. Ph.D. dissertation, University of Oklahoma.

1986 The Historical Development of a Culture Complex: The Basis for Understanding Architectural Misconceptions of the Antelope Creek Focus. In *Current Trends in Southern Plains Archaeology*, ed. T. G. Baugh, Pp. 111-128. Plains Anthropologist Memoir 21.

Lintz, C. (ed.)
1985 *A Chronological Framework of the Fort Carson Pinon Canyon Maneuver Site, Las Animas County, Colorado*. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-3-A021.

Lintz, C. and J. L. Anderson (eds.)
1989 *Temporal Assessment of Diagnostic Materials from the Pinon Canyon Maneuver Site*. Memoirs of the Colorado Archaeological Society. No. 4.

Loendorf, L. L.
1989 *Nine Rock Art Sites in the Pinon Canyon Maneuver Site, Southeastern Colorado*. Contribution 248, Department of Anthropology, University of North Dakota.

1991 Cation-ratio Varnish Dating and Petroglyph Chronology in Southeastern Colorado. *Antiquity* 65: 246-255.

1998 *Visions from Canyon Walls: Petroglyphs and Pictographs from the Pinon Canyon Maneuver Site*. U.S. Army, Directorate of Environmental Compliance and Management, Fort Carson, CO.

Loendorf, L. L. and D. Clise

1997 *Interviews with Former Residents of the Pinon Canyon Maneuver Site, Volume I and II*. University of Arizona, Tucson. Submitted to the National Park Service, Midwest Archaeological Center, Lincoln, NE.

Loendorf, L. L. and L. Gange

1990 *The Rock Art of Pinon Canyon Maneuver Site*. 22 minute videotape. University of North Dakota, Grand Forks.

Loendorf, L. L., C. Kordecki and M. L. Gregg

1996 *Archaeological Investigations at Ceramic Stage Sites in the Pinon Canyon Maneuver Site, Colorado*. University of North Dakota, Grant Forks, Department of Anthropology Contribution No. 308. MS on file, National Park Service, Rocky Mountain Regional Office, Interagency Archeological Services.

Loendorf, L. L. and D. Kuehn

1991 *1989 Rock Art Research Pinon Canyon Maneuver Site, Southeastern Colorado*. Contribution 258, Department of Anthropology, University of North Dakota.

Loendorf, L. L. and C. Loendorf

1999 *Archaeological Sites in Welsh Canyon, Las Animas County, Colorado*. New Mexico State University, Las Cruces. Submitted to the National Park Service, Midwest Archeological Center, Lincoln, NE.

Logan, H. C.

1959 *Cartridges: A Pictorial Digest of Small Arms Ammunition*. Bonanza Books, New York.

Lutz, B. and W. Hunt Jr.

1979 Models for Patterns and Change in Prehistoric Settlement-Subsistence Systems of the Purgatoire and Apishapa Highlands. MS on file, Interagency Archaeological Service, Denver.

Magne, M. P. R.

1985 *Lithics and Livelihood: Stone Tool Technologies of Central and Southern Interior British Columbia*. Archaeological Survey of Canada Paper No. 133. National Museums of Canada, Ottawa.

McFaul, M. and R. Reider

1988a Geoarchaeological Investigations. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado* (vol. I). Ed. W. Andrefsky, Jr., pp. III-1-32. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-7-B054 (amended 1990).

1988b Physical Environment. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado* (vol. I). Ed. W. Andrefsky, Jr., pp. II-1-12. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-7-B054 (amended 1990).

1990 Physical Environment and Geoarchaeological Investigations. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado* (vol.1), ed. W. Andrefsky, Jr. MS on file, Colorado Historical Society, Denver.

McHugh, T.

1958 Social Behaviour of the American Buffalo. *Zoologica* 43: 1-40.

McKern, W. C.

1939 The Midwestern Taxonomic Method as an aid to archaeological study. *American Antiquity* 4:579-82.

Michlovic, M. G.

1986 Cultural Evolutionism and Plains Archaeology. *Plains Anthropologist* 31: 207-218.

Mitchell, M.

1996 *The Sopris Phase in Regional Perspective: An Examination of Prehistoric Frontiers in Southeast Colorado.* Paper presented at the Annual Meeting of the Colorado Council of Professional Archaeologists, Anasazi Heritage Center, Dolores, CO.

Mussett, A. E. And M. A. Khan

2000 *Looking into the Earth: An Introduction to Geological* Geophysics. Cambridge University Press.

National Park Service

1989 *Historic American Buildings Survey: Homesteads and Ranches of Pinon Canyon, Las Animas County, Colorado.* National Park Service, Rocky Mountain Regional Office, Denver.

Nickens, P.R. (ed.)

1988 Archaeology of the Eastern Ute: a Symposium. *Colorado Council of Professional Archaeologists Occasional Papers* 1.

Owens, M., L. L. Loendorf, V. Shiavitti and C. R. Loendorf

2000 *Archaeological Sites Inventory in the Black Hills of the Pinon Canyon Maneuver Site, Las Animas County, Colorado.* Cultural Resource Management Series No. 4. Department of Sociology and Anthropology. New Mexico State University, Las Cruces, NM.

Owens, M. and L. Loendorf

2004 *Archaeological sites Inventory of the Training Area 10 and 12 Portions on the Pinon Canyon Maneuver Site, Las Animas County, Colorado.* Fort Carson Cultural Resource Management Series, Contribution No. 10. Department of Sociology and Anthropology, New Mexico State University, Las Cruces, NM.

2002 *Archaeological Sites Inventory of the Training Area 7 Portion of the Pinon Canyon Maneuver Site, Las Animas County, Colorado.* Cultural Resource Management Series Contribution No. 5. Department of the Army, Fort Carson, CO.

Peebles, T. C.

1984 *Survey Methodology and Techniques.* Contribution No. 5. Phase I of the Fort Carson-Pinon Canyon Project. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-3-A021.

Pozorski, S. and T. Pozorski

1984 A Descriptive Report on Sites Tested during Phase I of the Fort Carson-Pinon Canyon Archaeological Project. vol. I: Sites 5LA2238-5LA5320. Contribution No. 6. Phase I of the Fort Carson-Pinon Canyon Project. MS submitted to National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX1200-3-A021.

Pozorski, T. and S. Pozorski

1984a *Cultural Content of the Site Types Defined During Phase I of the Fort Carson-Pinon Canyon Project.* MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-3-A021.

1984b *A Proposed Research Design for Phase II of the Fort Carson-Pinon Canyon Project.* MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-3-A021.

Renaud, E. B.

1931 *Archaeological Survey of Eastern Colorado.* Department of Anthropology, University of Denver Report 1.

1932 *Archaeological Survey of Eastern Colorado: Second Report.* Department of Anthropology, University of Denver, Denver.

1933 *Archaeological Survey of Eastern Colorado: Third Report.* Department of Anthropology, University of Denver, Denver.

1937a Pictographs and Petroglyphs of Colorado - III. In *Southwestern Lore* 3:12-19.

1937b Pictographs and Petroglyphs of Colorado - V. In *Southwestern Lore* 3:45-48.

1942a *Indian Stone Enclosures of Colorado and New Mexico. Archaeological Series, Second paper.* Department of Anthropology, University of Denver, Denver.

1942b Some Stone Enclosures. In *Southwestern Lore* 7:55-57.

Renaud, E. B. and J. Chatin

1943 *Archaeological Sites of the Cuchara Drainage, Southern Colorado.* Archaeological Series, Fourth paper. Department of Anthropology, University of Denver, Denver.

Reeves, B. O. K.

1973 The Concept of an Altithermal Cultural Hiatus in Northern Plains Archaeology. In *American Anthropologist* 75:1221-1253.

Rock, J.

1988 Tin Canisters: Their Identification. Manuscript on file, San Juan National Forest Archaeology Library, Durango, CO.

Roe, F.

1951 *The North American Buffalo: a Critical Study of the Species in its Wild State.* University of Toronto Press, Toronto.

1955 *The Indian and the Horse.* University of Oklahoma Press, Norman.

Sant and Kalasz

1987 Colorado State Site Form, 5LA4417.

Schlesier, K. H.
1972 Rethinking the Dismal River Aspect and the Plains Athabaskans, A.D. 1692-1768. *Plains Anthropologist* 17:101-133.

Schroeder, A. H.
1974 A Study of the Apache Indians. In *American Indian Ethnohistory: Indians of the Southwest.* Ed. D. A. Horr. Garland Books, New York.

Schuldenrein, J. (ed.)
1985 Geomorphological and Geoarchaeological Investigations at the U.S. Army Fort Carson-Pinon Canyon Maneuver Site, Las Animas County, Colorado. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-3-AO64.

Scott, R. G.
1968 Geological and structure contour map of the La Junta Quadrangle, Colorado and Kansas: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-560, scale 1:250,000.

Shiavitti, V. W., L. L. Loendorf, and E. Hill
2001 *Archaeological Investigations at Eleven Sites of Welsh Canyon in the Pinon Canyon Maneuver Site, Las Animas County, Colorado.* Department of Sociology and Anthropology, New Mexico State University, Las Cruces, NM.

South, S.
1977 *Method and Theory in Historical Archaeology.* Academic Press, New York.

Somers, L.
1998 Geophysical Remote Sensing Survey of the Quartermaster Depot Dump at Fort Laramie National Historic Site. In *Archeology at the Fort Laramie Quartermaster Dump Area, 1994-1996.* D. N. Walker, ed. Cultural Resource Selections Intermountain Region, No. 13. Intermountain Region, National Park Service.

Spielmann, K. (ed.)
1991 *Farmers, Hunters, and Colonists.* University of Arizona Press.

Spivey, T.
1979 *A Historical Guide of Wagon Hardware and Blacksmith Supplies.* Museum of the Great Plains, Lawton, OK.

Stevenson, C. M.

1996 Hydration Analysis of Obsidian Artifacts from Sites 5AA952, 5LA3570, 5LA5360 and Site 3, Colorado In *Evaluative Testing of Eight Archaeological Sites in the Pinon Canyon Maneuver Site, Las Animas County, Colorado*. Fort Lewis College, Durango, CO.

Stoffle, R.W., H. Dobyns, M. Evans, O. Stewart

1984 Toyavita Piavuhuru Koroin, "Canyon of Mother Earth": Ethnohistory and Native American Religious Concerns in the Fort Carson-Pinon Canyon Maneuver Area. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-3-AOO6.

Strong, W. D.

1935 An Introduction to Nebraska Archaeology. *Smithsonian Miscellaneous Collections 100*:353-94.

Turner, C. G. II

1980 Appendix I. Suggestive dental evidence for Athabascan affiliation in the Colorado skeletal series. In *Trinidad Lake Cultural Resource Study, Part II: Prehistoric Occupation of the Upper Purgatoire River Valley*, ed. C. E. Wood and G. A. Bair. MS on file, Interagency Archaeological Services, Denver.

U.S. Soil Conservation Service

1983 Soils manuscript for the Pinon Canyon Maneuver Site: Trinidad, Colorado. U.S. unpublished MS. Department of Agriculture.

Van Ness, M. and S. Kalasz

1988 Biotic environment. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado* (vol. I). Ed. W. Andrefsky, Jr., pp. II-13-50. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-7-B054 (amended 1990).

Vickers, J. R.

1994 Cultures of the Northwestern Plains: from the Boreal Forest edge to Milk River. In *Plains Indians A.D. 500-1500*. Ed. K. Schlesier, pp. 3-33. University of Oklahoma Press, Norman.

von Guerard, P, P. Abbot, and R. Nickless

1987 Hydrology of the U.S. Army Pinon Canyon Maneuver Site, Las Animas County, Colorado. *U.S. Geological Survey, Water-Resources Investigations Report* 87-4227. Denver.

Webb, W. P.
1931 *The Great Plains*. Grossett and Dunlap, New York.

Weber, K. R.
1988 Ethnohistory of the Pinon Canyon Maneuver Site. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado* (vol. III). Ed. W. Andrefsky, Jr., pp. XVII-1-28. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-7-B054 (amended 1990).

Wedel, W.
1936 An Introduction to Pawnee Archaeology. *Bureau of American Ethnology Bulletin* 112.

1961 *Prehistoric Man on the Great Plains*. University of Oklahoma Press, Norman.

1983 Changing perspectives in Plains Archaeology. *Plains Anthropologist* 28: 89-97.

Wendland, W. M.
1978 Holocene man in North America: the ecological setting and climatic background. *Plains Anthropologist* 23: 273-287.

Wendland, W. M. and R. Bryson.
1974 Dating climatic episodes of the Holocene. *Quaternary Research* 4:9-24.

Weymouth, J. W.
1986 Geophysical Methods of Archaeological Site Surveying. In Advances in Archaeological Method and Theory. vol. 9. Ed. M. B. Shiffer, pp. 311-395. Academic Press, New York.

1991 *Ground Resistance Measurements at Sites on the Brown Sheep Ranch During the NPS Training School.* MS on file National Park Service, Rocky Mountain Regional Office, Interagency Archeological Services, Denver.

Weymouth, J. W. and R. Huggins
1985 Geophysical Surveying of Archaeological Sites. In *Archaeological Geology*, G. Rapp Jr. and J. A. Gifford, eds. Pp. 191-235. Yale University Press.

Wheat, J. B.
1972 The Olsen-Chubbuck Site: A Paleo-Indian Bison Kill. *Society for American Archaeology, Memoir* 26.

Willey, G. R. and P. Phillips
1958 *Method and Theory in American Archaeology*. University of Chicago Press, Chicago.

Wilson, M. C.
1988 Bison dentitions from the Henry Smith site, Montana: evidence for seasonality and paleoenvironments at an Avonlea bison kill. In *Avonlea Yesterday and Today: Archaeology and Prehistory*. Ed. L. Davis, pp. 203-225. Saskatchewan Archaeological Society.

Withers, A. M.
1954 Reports of Archaeological Fieldwork in Colorado, Wyoming, New Mexico, Arizona, and Utah in 1952 and 1953 -- University of Denver Archaeological Fieldwork. *Southwestern Lore* 19:1-3.

Wood, C. E. and G. A. Bair
1980 Trinidad Lake Cultural Resources Study, Part II: The Prehistoric Occupation of the Upper Purgatoire River Valley, Southeastern Colorado. MS on file, Interagency Archaeological Services, Denver.

Wood-Simpson, C.
1976 Trinchera Cave: A Rock Shelter in Southeastern Colorado. M.A. thesis, University of Wyoming.

Yanovsky, E.
1936 Food Plants of the North American Indians. United States Department of Agriculture, Miscellaneous Publications No. 237, Washington DC.

Zier, C.
1988 Prehistoric Rock Art. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado* (vol. II). Ed. W. Andrefsky, Jr., pp. XIII-1-29. MS submitted to the National Park Service, Rocky Mountain Regional Office, Denver. Contract No. CX 1200-7-B054. (amended 1990).

Zier, C. J., J. H. Altschul, M. K. Kelly, M. R. Rose, K. P. Schweigert, and K. R. Weber
1987 *Historic Preservation Plan for Fort Carson Military Reservation, Colorado*. MS on file, the National Park Service, Rocky Mountain Regional Office, Denver.

Zier, C. J. and S. M. Kalasz
1999 Colorado Prehistory: A Context for the Arkansas River Basin. Colorado Council of Professional Archaeologists, Denver.

APPENDIX I

Faunal Analysis of the Vertebrate Remains from Four Sites in Southeastern Colorado: 5LA3333, 5LA4417, 5LA5612, and 5LA6108

Cerisa Reynolds
Fort Lewis College

A total of 1,517 specimens were collected from all four sites (and two missing specimens), only 259 of which were identifiable to any degree (Table 1). The analysis was conducted in an effort to determine the cultural relationship that the inhabitants of these four sites had with the fauna around them.

Table 1. Number of specimens and identified specimens for each site studied here and their percentages out of the total assemblage analyzed.

Site Name/Number	Number of specimens	Percent out of total for all four sites	Number of identified specimens	Percent out of total of identified for all four sites
5LA3333	16	1	6	2
5LA4417	240	16	43	17
5LA5612	593	39	69	27
5LA6108	668	44	141	54
Total	1,517	100	259	100

Laboratory Methods and Techniques

All faunal remains were first separated between identifiable and unidentifiable. Identifiable bones were separated individually while unidentifiable bones were left in bulk according to their provenience.

Identifiable bones were analyzed by referencing the comparative faunal collection at the Department of Anthropology at Fort Lewis College (FLC). A variety of comparative literature was consulted as well including Allaire (ND), Brown and Gustafson (1979), Gilbert et al. (1985), Hillson (1996), Olsen (1968, 1973), and Schmid (1972). However, despite the use of such literature, actual identification to *species* was made only through physical comparison with those remains in the comparative collection at hand. The only exception to this is the Badger baculum from Feature 5 at 5LA6108, which was determined using drawn and photographed sources (Burt 1960). Whenever possible, bones were identified to their skeletal element, portion of element, side of body that the element was from, age of the specimen at death (based on tooth wear for two horse specimens and epiphyseal fusion for appendicular elements), and taxon. Sexing the bones was not a priority in this analysis. Ribs, vertebrae, and phalanges were rarely identified to taxon, and many other bones were not identified beyond element and size primarily due to their fragmentary state. The lack of appropriate comparative material and expertise were also factors but did not prove to be an overall hindrance. When taxon identification was not possible, the faunal materials were identified by class (Amphibia, Aves, etc.), or as small mammal (cottontail rabbit or smaller), medium mammal (larger than cottontail rabbit but smaller than a deer), or large mammal (a deer or larger). In the worst case scenario, small and poorly preserved vertebra specimens could be identified only to "unidentified Vertebrate" as it could not herein be determined if they were mammal, reptile, etc..

The analysis also involved determining which bones were burned or showed signs of butchering, carnivore gnawing, mineral deposition, or any other human and/or nonhuman modification. Herein Marshall's (1989) definition of bone modification will be used and the analysis will attempt to determine both the process and pattern as explained by him:

"Bone modification means any alteration in size, structure, or texture of bone by an external agent... Modification has two components: 1) process (=activity, agent, cause, causal agent, causal factor, event, external agent, force, formation process, modifier, sequence of events, strategy) by which patterns come to be produced on a bone (i.e., how the modification was produced) and 2) pattern (=effect) which is the resulting change on the bone caused by the process (i.e., what the modification is)" (Marshall 1989:8).

Terminology used for those bones modified by carnivores/scavengers will follow the vocabulary set forth by Binford (1981) such as gnawing, puncture, and scoring. The degree of burning was loosely determined by following the color standards set forth by Buikstra and Swegle (1989), which considers slight burning to be of a light brown color, smoked and carbonized bone to be black in color, and extreme and complete burning to be represented by specimens being shades of blue to completely white (referred to as calcined bone). All specimens that were modified or burned are mentioned as such.

Identifiable bones were weighed (grams) and measured (metric) with digital instruments and catalogued individually. For all individual bones and assemblages of bones weighed during this analysis, it is important to note that the digital scale used does not show weights of less than 0.1 grams and therefore all measurements lower than this are simply recorded as 0.1 grams. Because of this, weight will not become a factor when comparing densities of the faunal remains within test units, features, or sites as the much smaller, lighter bones take on more prominence than they would with a more precise scale.

Measurements of complete bones were conducted according to the guidelines set forth by Driesch (1976). Following these guidelines, burned bones and pathologically abnormal bones were not measured. However, this specific analysis strays from Driesch's (1976) guidelines even though the directions on how to measure each element are still followed. Here, more attention is given to the smaller mammals, phalanges and vertebrae whose *exact* location within the skeleton is not known are still measured, and complete bones from immature individuals are measured (since the database makes it clear how old the specimen was). All measurements were taken at their greatest expanse, rather than having a variety of locations wherein each specific element was measured as Driesch (1976) suggests. This was primarily due to the small sample size. This specific analysis was not geared towards the measurements being intended for future comparative studies.

Measurements of identifiable bones were conducted in four stages (length, breadth, height, and depth), following the definitions as set forth by Driesch (1976:14):

<u>Length</u>: (a) for all bones of the axial skeleton and of the pectoral and pelvic girdles is that dimension measured in a cranio-caudal direction.
(b) for all bones of the remaining appendicular skeleton is that dimension measured in a proximo-distal direction.

<u>Breadth</u>: (width) on all bones is that dimension measured in a medio-lateral direction.

<u>Height</u>: for all bones of the skull, of the axial skeleton, and of the pectoral and pelvic girdles is that dimension measured in a dorso-ventral direction.

<u>Depth</u>: for all bones of the extremities is that dimension measured in a cranio-caudal direction (i.e., dorso-volar or dorso-plantar).

Measurements were taken within groups of skeletal element so as to attain consistencies and reduce the amount of measuring error (Klein and Cruz-Uribe 1984). Following the guidelines set forth by Dean (1992), all measurements were rounded to the nearest millimeter.

Unidentifiable bones were separated between those unidentifiable bones that were burned or not burned, and were weighed as bulk according to their field specimen numbers/provenience. Those unidentifiable specimens that have been modified were separated from the bulk, as well.

Cataloguing and curation of all faunal specimens was conducted following the guidelines of Dean (1992). All results were entered into a Microsoft Access database and were used to determine the Number of Identified Specimens (NISP) and the Minimum Number of Individuals (MNI).

NISP is simply the count of every identified bone for each taxon. This method is very useful in that no further manipulation is required, but it is flawed for several reasons and will therefore not be used alone.

> "To begin with, it ignores the fact that the skeletons of some species have more parts than the skeletons of others... The NISP will also overemphasize the importance of a species that tended to reach a site intact versus a species that was usually dismembered before transport... [and], the NISP is very sensitive to bone fragmentation" (Klein and Cruz-Uribe 1984:25) (see also Grayson 1984).

In addition, larger mammals are easier to identify and, therefore, will appear more important to the assemblage. One can easily identify most bones from a large mammal, while one can only identify "the cranial elements and teeth of a small rodent to the same taxonomic level" (Grayson 1984:21).

MNI is reached by analyzing the assemblage representing each species (or the NISP) and determining the minimum number of individuals that could have produced the assemblage. During this analysis, relative age, size, and element side were all taken into account when determining the MNI of a present species. Thus, three right tibias and two left tibias of a cottontail could only account for three individuals (seen in the three right tibias). However, if the three right tibias are all mature, and one of the left tibias is not, the MNI would here be concluded as four. The main flaw present in the analysis of MNI is the fact that the resulting numbers are almost certainly biased by how the analyst conducted their research. For this small sample, there was little MNI analysis that could be attempted. When numbers were assigned to MNI counts of higher than one, an explanation is provided within the interpretations.

Both NISP and MNI were used while interpreting the results with NISP representing the maximum number of individuals present and MNI representing the minimum number of individuals present. Both the NISP and MNI are simply counted for each feature (or unit within features) with no distinction being made between layers and levels. However, when totals are calculated for sites, it is not assumed by the analyst that those specimens from different features are from different individuals. Therefore, since it is possible that the cottontail remains from one feature may have been deposited there separately, but still belong to the individual whose remains have been identified in another feature (if they were dragged there by an animal, for instance), MNI totals for sites try to take this into account.

All results were interpreted by looking at the location that the specimens were recovered from (in a drainage, hearth, specific feature, etc.), the condition of the specimen, and the intrusive nature and/or economic value of the represented species.

Identified Taxon

The following information pertains to the current distribution of those species identified during the analysis. Economic importance is discussed when relevant as is the intrusive nature of the species. Those orders, families, and other taxonomic categories higher than species are not discussed here, nor is the domesticated species horse (represented by two specimens in the assemblage).

Northern Grasshopper Mouse (*Onychomys leucogaster*):

These mice are "rodents by heritage but carnivores by habit" (Armstrong 1993:25) and are the "most thoroughly carnivorous of North American mice" (Fitzgerald et al. 1994:248). They live in burrows of their own making or that other animals constructed in semi-desert regions with grass, sagebrush, greasewood, or rabbit brush (Burt and Grossenheider 1980:166; Lechleitner 1969:137). The grasshopper mouse diet includes beetles, insects, grasshoppers, crickets, spiders, scorpions, pill bugs, larger rodents and other mice, lizards, some carrion, and seeds (Armstrong 1993:25; Burt and Grossenheider 1980:166; Fitzgerald et al. 1994:248; Lechleitner 1969:137). "Green vegetation seems not to be used... [and] because of the animal protein in their diet, grasshopper mice have a strong acrid odor, probably in the urine, and can be identified by smell" (Fitzgerald et al. 1994:248). Because of their carnivorous activities, their incisors are more sharp and dagger-like than the usual broad rodent incisors (Armstrong 1993:25), and they use these teeth to their advantage when they attack mice and other living prey. Grasshopper mice are monogamous and both adults tend to the young (Fitzgerald et al. 1994:248). Predators include the usual enemies of mice such as owls, coyotes, and badgers, "but no predator can afford to make them a staple. Grasshopper mice are a step higher in the food chain than usual rodents, and hence populations are smaller" (Armstrong 1993:25).

Woodrat (*Neotema species*):

Of the six woodrat species in the state, the four who currently live in the area of PCMS are the Southern Plains woodrat (*N. micropus*), the Mexican woodrat (*N. mexicana*), the White-throated woodrat (*N. albigula*) and the Eastern woodrat (*N. floridana*) (Burt and Grossenheider 1980:167; Fitzgerald et al. 1994:252-264). Woodrats use anything they can find to insulate their homes and these homes may be used and added onto by various generations (Armstrong 1993:27). In the plains of southeastern Colorado, denning homes are made around cholla cactus (Armstrong 1993:27) and are constructed using sticks and caches of cactus, yucca, and brush (Burt and Grossenheider 1980:167). While woodrats are protected in their dens, they are still vulnerable to predators such as birds of prey and snakes (Armstrong 1993:27). Woodrats have been procured and consumed by various peoples in North America both historically and prehistorically (see Brown 1993:315-316).

The analysis conducted does not make the distinction between the various species of the woodrat as the comparative collection did not allow for such specifications.

Pocket Gophers (*Geomyidae species*):

Pocket gophers are a family of rodents that live only in North America and occur throughout the state of Colorado. Various species live within the testing area, and while different kinds of pocket gophers rarely live in the same field, it does occur because the ranges of many kinds do intersect (Burt and Grossenheider 1980:124). Their name derives from their "pockets", or pouches, which are external cheekpouches that are fur-lined, open on either side, and carry their food and nesting materials. They are most easily recognized by their large, yellow incisors that are always exposed (Armstrong 1993:19; Burt and Grossenheider 1980:124).

Pocket gophers are underground animals, rarely leaving their distinctive burrows, which may be as long as 200 yards (Armstrong 1993:19) and have fan-shaped mounds at the end (Burt and Grossenheider 1980:124). Their diet consists mainly of roots, tubers, and other vegetation. Plants are frequently eaten after being removed from the ground surface and taken into the gopher's underground tunnel (Armstrong 1993:19; Burt and Grossenheid 1980:124). Predators include coyotes, badgers, gopher snakes, and owls. Also, various Native American groups have been ethnographically recorded while actively hunting and consuming these rodents (Brown 1993:310).

Cottontail (*Sylvilagus sp.*):

Three cottontail species currently inhabit the state of Colorado: *S. audubonii* (Desert cottontail), *S. nuttallii* (Mountain cottontail), and *S. floridanus* (Eastern cottontail). Out of these three species, only the desert cottontail (*Sylvilagus audubonii*) currently lives within the PCMS study area (Fitzgerald et a. 1994:139,141). This analysis follows Hill's (2003) conclusion in that "these [three] species are impossible to distinguish on the basis of post-cranial skeletal remains... [and due to] present distributions, it is likely that the specimens identified in this assemblage represent *S. audubonii*"(Hill 2003:61). This is, of course, assuming that current distribution is not very different from historic and/or prehistoric cottontail distribution.

The Desert cottontail prefers to live in open areas covered somewhat densely with grasses, sagebrush, pinons and junipers (Burt and Grossenheider 1990:211; Hill 2003:61).Young are born throughout the year and are birthed blind into a shallow, grass or fur-lined nest that has been excavated into the ground (Burt and Grossenheider 1990:211; Brown et al. 2004:292). "Females are 'absentee mothers' and up to [thirty] hours may elapse between nursing bouts" (Fitzgerald et al. 1994:141).

Desert cottontail may live more than two years in the wild (Burt and Grossenheider 1990:211) and are capable swimmers who can also maneuver their way through dense coverage (Fitzgerald et al. 1994:141). Their typical diet consists of forbs, grasses (Fitzgerald et al. 1994:139), cacti, shrubs, cultivated plants such as corn, and their own droppings, which are a source of vitamin B (Brown et al. 2004:292).

"Predation is the primary regulator of cottontail abundance" (Brown et al. 2004:292) and natural predators include "coyotes, foxes, badgers, weasels, eagles, hawks, owls, [and] snakes... Tularemia and plague are not uncommon, and large fluctuations in population numbers occur periodically" (Fitzgerald et al. 1994:141).

Cottontail are also an important game mammal to humans and were/are hunted for fur (for clothing, trade, blankets, etc.), food, tools (made from the bones), and simply for sport (Brown 1993:303; Burt and Grossenheider 1990:211; Rodeck ND:20). Cottontail are generally easy to hunt for various reasons including their travel along open trails, the fact that they are not particularly quick, and that they can be distracted causing them to freeze, allowing a hunter time to take aim (Brown 1993:302; Brown et al. 2004:292).

Striped Skunk (*Mephitis mephitis*):

The striped skunk is the largest skunk species in Colorado and lives across the entire state (Armstrong 1993:41). Striped skunks tend to prefer semi-open areas such as the prairie (Burt and Grossenheider 1980:65), they are apparently skilled swimmers (Wilber and Weidenbacher 1961:372), and most do not live longer than three years (Fitzgerald et al. 1994:358). Skunks den in various places during the winter, after birthing young, or even just

to rest (Burt and Grossenheider 1980:65; Fitzgerald et al. 1994:357; Hill 2003:66) and during warmer times bed down in open areas above ground (Fitzgerald et al. 1994:357). Of significance for this study, since the remains of one striped skunk were recovered from Feature 5 from 5LA6108, is research conducted by Lariviere et al. (1999) on striped skunks in the Canadian prairies. Their research showed that skunks prefer to take advantage of farmsteads as denning sites, and while their results revealed that they prefer buildings with accessible spots beneath them, it also showed that choice of a denning habitat "was independent of type of building, degree of use by humans, whether the floor was elevated, distance to water, distance to the nearest habitat edge and building size" (Lariviere et al 1999:98). Their research found that, for various reasons, residing beneath a historic building provides a convenient form of safety from the elements and from predators.

Striped skunks are omnivorous and opportunistic. Their diet includes carrion, mice, eggs, voles, fruit, insects, grubs, beetles, and grasshoppers (Armstrong 1993:41; Burt and Grossenheider 1980:65; Fitzgerald et al. 1994:357). Coyotes, great horned owls, mountain lions, and carnivores of this type prey on striped skunks (Armstrong 1993:41; Fitzgerald et al. 1994:358), but "as a general rule, any animal large enough to kill a skunk is also smart enough not to bother" (Armstrong 1993:41). This is because the skunk "does not hesitate to defend itself with its potent scent, which is squirted from a pair of glands at the base of the tail and which may be rather accurately directed to a distance of 15 or 20 feet" (Rodeck ND:58). Rabies are common among striped skunks and has been of particular importance in biological studies in the past when looking at humans and their interactions with them.

The striped skunk is also a very valuable mammal because of its high quality fur (Burt and Grossenheider 1980:65; Rodeck ND:58). Skunks were heavily trapped and raised for their pelts during the late 19th and early 20th centuries (Hill 2003:66) and fur trappers are still taking thousands of skunk pelts each year (Fitzgerald et al. 1994:358).

Badger (*Taxidea taxus*):

Badgers are aggressive mammals that live throughout the various ecosystems of Colorado and prefer open habitats such as grasslands and deserts (Burt and Grossenheider 1980:64; Fitzgerald et al. 1994:350). "Badger populations are made up of two groups, resident adult animals and juveniles without permanent home ranges" (Fitzgerald et al. 1994:351). They are "most common in areas with abundant populations of ground squirrels, prairie dogs, and pocket gophers" (Fitzgerald et al. 1994:350), which is probably due to the fact that these burrowing rodents make up the staple of a badger diet (Armstrong 1993:40; Burt and Grossenheider 1980:64). The typical badger diet also consists of nestling birds and their eggs, cottontails and jackrabbits, insects, snakes, lizards, and carrion (Armstrong 1993:40; Fitzgerald et al. 1994:350). Badgers have been known to combine hunting efforts with coyotes (Fitzgerald et al. 1994:305). When frozen ground keeps badgers from digging for food, they rely on mice for sustenance or simply stay sleeping in their burrow (Armstrong 1993:40). Times of excess, however, may result in a badger creating a cache of defeated prey (Fitzgerald et al. 1994:350).

Badgers den in borrows that they have excavated with their long front claws, (which may be longer than 50 mm in length) (Fitzgerald et al. 1994:350). These are the same claws that they use to reach the burrowing mammals that makeup the bulk of their diet. Grown badgers have few natural predators, in part due to their thick hide and in part due to their aggressive and unpleasant nature (Armstrong 1993:40; Fitzgerald et al. 1994:351). While predators such as golden eagles and coyotes can kill younger badgers (Messick et al. 1981), this mammal has been known to live up to fourteen years in the wild (Fitzgerald et al. 1994:351).

Badgers have been historically killed for their fur (Armstrong 1993:40; Fitzgerald et al. 1994:358), though their fur is thought to have little economic value (Burt and Grossenheider 1980:64).

Coyote (*Canis latrans*):

"Coyotes are one of the most widespread and adaptable carnivores in North America... Prior to efforts to eliminate them, they probably reached their greatest numbers on the plains of North America (Gier 1975)" (Fitzgerald et al. 1994:302). Coyotes can run faster than 40 mph (Burt and Grossenheider 1980:70), will crossbreed with domestic dogs (Burt and Grossenheider 1980:70; Lechleitner 1969:169), and can live for up to twenty years (although ten years appears to be the average) (Armstrong 1993:32). While the competition of a coyote may restrict populations of other carnivores, coyotes have, as mentioned above, been known to combine their hunting efforts with badgers (Fitzgerald et al. 1994:305).

Coyotes are truly adaptable and will eat nearly any plant or animal at their disposal although rodents and rabbits appear to be staples (Armstrong 1993:32; Burt and Grossenheider 1980:70; Lechleitner 1969:169). They will create caches of their uneaten food (Burt and Grossenheider 1980:70) and frequently hunt in pairs or larger groups (Burt and Grossenheider 1980:70; Lechleitner 1969:169).

> "In southeastern Colorado, juniper 'berries' were a major component of the winter diet; rodents were important in spring, ungulate fawns in June, and grasshoppers were eaten when available in summer (Gese et al. 1988 ...). An adult coyote requires 600 g of meat per day (250 kg/yr) and a lactating female requires half again as much (Gier 1975)" (Fitzgerald et al. 1994:302-303).

The coyotes of the United States have suffered severe efforts to expel them because they are seen as scavengers and hunters who are nuisances to farmers and ranchers, occasionally killing their livestock.

> "From 1915 to 1947, bounties were paid on 1,884,897 coyotes in the United States... The animals have been shot from airplanes, injected with chemicals, trapped, run down with snowmobiles and buried alive in dens. The result of this extermination effort is surprising. Coyotes have actually expanded their range in North America. In Colorado, coyotes are probably more abundant today than they were before the arrival of the first settlers" (Jeff Rennicke as quoted by Armstrong [1993:32]).

Wapiti/Elk (*Cervus canadensis*):

The American Elk is a highly social animal, often traveling or living in herds (Armstrong 1993:45; Bauer 1995:23) and is the largest deer native to Colorado (Armstrong 1993:45). Elk eat a large variety of plant materials, taking advantage of what is available in their ecosystem (Bauer 1995:26).

While the elk is only represented here from one specimen (the distal end of a tibia found near the bottom of Feature 8 at 5LA6108), this is an important specimen because the current distribution of elk does not extend into the PCMS area. While this specimen could have been procured elsewhere and transported to the site, elk distributions were once quite different than they are now. Prior to the last century, the range of American elk was nearly from coast to coast (Bauer 1995:15; Burt and Grossenheider 1980:215; Thomas and Toweill 1982:v) including the Great Plains of Colorado (Armstrong 1993:45; Fitzgerald et al.1994:383; Rodeck ND:12). Detailed research has shown that the elk subspecies historically living in the PCMS study area was probably the "Manitoba Elk"(Thomas and Toweill 1982:24), a subspecies that once flourished throughout the Great Plains of North

America (Thomas and Toweill 1982:34). However, hunting and overexploitation by the westward moving European settlers nearly drove the elk species to extinction, forcing the few herds still remaining to retreat to the deeper mountain areas (Rodeck ND:12).

Various accounts of the massive elk hunts that occurred historically quickly allow one to see how such a wide-ranging and plentiful animal became restricted to their current habitats:

> "Before the arrival of European settlers, wapiti ranged nearly throughout the area that is now Colorado, including the eastern plains. Market hunting nearly drove Coloradan elk to extinction. By 1910 only a few hundred elk remained" (Armstrong 1993:45).

> "In 1858, gold was discovered in what is now downtown Denver, and Colorado had a landrush of its own. With the influx of settlers, the focus of exploitation was no longer on furbearers but on game mammals, and what began as subsistence hunting soon shifted to commercial exploitation. Hunters supplied the mining camps and the settlements along the mountain front. The great herds of bison, elk, deer and pronghorn that had defined and dominated the ecosystems of the mountain parks and the Great Plains were slaughtered in a few years. At first they supplied the local market, but then—when General William L. Palmer's Denver Pacific Railroad linked Denver to the outside world, as represented by the Union Pacific at Cheyenne—markets expanded to the Midwest and even the East Coast. Native wildlife was no match for a settled human population with modern firearms and transportation. Elk were becoming rare in South Park in the early 1870s and were nearly extirpated by 1910, reduced to a herd of 500 to 1,000 animals on the Upper White River" (Fitzgerald et al. 1994:45).

> "Historically, [the American Elk] numbered in the millions and occupied a variety of habitats spanning nearly the length and breadth of North America. Then, in the face of sweeping continental exploration, settlement, and sometimes thoughtless exploitation, elk were reduced in number and range to a few herds in the mountainous West, where man's activities were mostly local... Settlements, roads, and railways in valleys and along watercourses disrupted traditional elk migrational routes and blocked access to or preempted critical wintering areas. Cattle and other livestock competed for available forage. Farming and ranching made the elk a nuisance in its own habitat. Early timber and mining activities infrequently gave consideration to wildlife's needs" (Thomas and Toweill 1982:v).

> "What was once the 'Great American Elk Hunt' evaporated with dream-like speed and is now but a memory of times past—a reminder that there are limits to human aspirations. By the early 1900s, elk had dwindled from a population of perhaps 10 million with a coast-to-coast range to about 90,000 animals that clung to remnant wilderness strongholds of western North America" (Thomas and Toweill 1982:509).

The desire to hunt elk was even further promoted by the fact that the elk's upper canine teeth, sometimes referred to as "ivories", were in high demand for their resemblance to ivory.

> "Around the turn of the century, there was a wide-scale hunt for elk buglers to make into jewelry and for curiosity value, a massive hunt that seems almost unreal today. Thousands of elk were slaughtered during the 1930s just to retrieve the canines" (Bauer 1995:34).

Similarly, Thomas and Toweill (1982:105), have made the comment that "no aspect of the elk, including hide and food parts, was more highly prized by North American Indians than its upper canine teeth", which were used as trade items, decoration and jewelry, and to display prestige.

Results

The results of the faunal analysis from sites 5LA3333, 5LA4417, 5LA5612, and 5LA6108 have been compiled below. Site and feature descriptions as well as details regarding the subsurface excavations can be found within the body of this report and are therefore not repeated here. Each site is discussed individually and then a conclusion is provided for the faunal assemblage from the 2003 season as a whole.

5LA3333

Of the four sites investigated here, 5LA3333 had the smallest amount of faunal remains. A total of sixteen specimens were collected, of which only six are identifiable. Specimens were retrieved from Structure 2/Test Unit 3, Structure 3/Test Unit 4, Structure 4/Test Unit 5, Feature 3/Test Unit 6, and the extramural Test Unit 7 (Tables 2 and 3). No faunal remains were recovered from the other two test units or from the twenty-one shovel tests excavated.

Table 2. Taxon in association with their feature/unit as recovered from 5LA3333. The numbers represent NISP counts and total counts for unidentifiable bones. S=Structure, F=Feature, and TU=Test Unit.

Taxon	S2 (TU3)	S3 (TU4)	S4 (TU5)	F3 (TU6)	TU7	Total
Sylvilagus sp. (cottontail rabbit)	1					1
Unidentified Rodentia			2			2
Unidentified small mammal			1			1
Unidentified large mammal	1				1	2
Unidentifiable bone		5	2	1	2	9
Total	2	5	5	1	3	16

Table 3. Total quantities and percentages for 5LA3333's faunal assemblage, including the total counts for all unidentifiable bones.

Structure/Unit	Number of Specimens	Percent of Site's Total Assemblage
Structure 2/Test Unit 3	2	13
Structure 3/Test Unit 4	5	31
Structure 4/Test Unit 5	5	31
Feature 3/Test Unit 6	1	6
Extramural/Test Unit 7	3	19
Total	16	100

Structure 2 (Test Unit 3): The distal end of a left cottontail humerus was found within Structure 2, probably of the *S. audubonii* species (Desert cottontail) (see above). Also, a large mammal long bone fragment was identified (Table 2). During the excavation of Test Unit 3, the excavator reported the presence of bioturbation, so the possibility exists that these remains were of an intrusive nature, perhaps with the large mammal long bone having been

carried in by a smaller animal.

Structure 3 (Test Unit 4): Five fragments of unidentifiable bone were recovered from the test unit within Structure 3 (Table 2). Three of the specimens were burned to the point of being calcined and the other two fragments show signs of weathering or exposure to the sun prior to burial.

Structure 4 (Test Unit 5): Two rodent skulls of the same unidentified species and the proximal end of a small mammal's left femur were recovered from Structure 4, as well as two fragments of unidentifiable bone (Table 2). Extensive rodent holes were reported during excavation, which may account for the collected specimens.

Feature 3 (Test Unit 6): Feature 3 contained only one piece of unidentifiable bone that had been burned to the point of being calcined, or white in color (Table 2).

Test Unit 7: This extramural test unit contained two pieces of unidentifiable bone and a long bone fragment from a large mammal that has many broken pieces associated with it (Table 2). The large mammal long bone fragment (as well as the broken pieces associated with it) and one unidentifiable bone show signs of weathering or exposure to the sun prior to burial. The long bone fragment also may exhibit signs of mineral deposition.

Conclusions, 5LA3333

This historic site with a prehistoric component provided the assemblage with a very small faunal sample and while the one cottontail specimen may have been procured by the site's past inhabitants, there appears to be no definite evidence for direct cultural modification to any of the site's faunal assemblage. Due to this, no safe assumptions as to the natural or cultural origin of any of the specimens can be made.

5LA4417

This is a prehistoric site with a historic component and faunal specimens were found within Test Units 1, 2, 4, 5, and 7 and none were found in the 15 shovel tests (Table 4). The prehistoric site yielded a total of 240 bone specimens (and two unidentifiable fragments that are now missing). Of these, a total of 43 specimens are in some way identifiable (Table 1). Bones from each of these units show evidence of burning and are various colors ranging from dark black to white to blue.

Feature 1 (Test Unit 2 and Test Unit 4):

Feature 1 (Test Unit 2): Test Unit 2, located within Feature 1, had a total of 40 specimens (see Tables 4 and 5), three of which are identifiable: an ulna from an unidentified rodent, a thoracic vertebra from an unidentified small mammal, and a vertebra from an unidentified small to medium sized mammal. Thirty-seven unidentifiable specimens were recovered from within the unit, 24 of which were burned. The burning varies from slightly smoked to completely calcined from specimen to specimen.

One piece of unidentifiable bone that was not burned, found within Layer 2, Level 1 of Unit 2, was the fragment of a medium to large mammal bone that appears to have been modified (see Figure 1). The fragment has slight polishing and what looks like flaking along its edges. At first glance, it appears that this bone was purposefully modified by humans, but as Binford (1981:81-82) notes, "chipped-back" bones resulting from the gnawing of carnivores can be easily confused with a bone tool that resembles lithic tool technology. It

is therefore difficult to determine whether this bone was modified by humans or by carnivorous activities.

Table 4. Total quantities and percentages for 5LA4417's faunal assemblage, including the total counts for all unidentifiable bones.

Test Unit	Number of Specimens	Percent of Site's Total
Test Unit 1	7	2.92
Test Unit 2	40	16.67
Test Unit 4	21	8.8
Test Unit 5	166	69.2
Test Unit 7	2	1.0
Test Unit 1/Test Unit 7	4	1.7
Total	240	100

Figure 1. Modified bone fragment with evidence of carnivore gnawing. Test Unit 2, 5LA4417.

Also found within this test unit was one fragment of bone that has since been lost and is therefore not included in this analysis.

Table 5. Taxon NISP and MNI, including total counts for unidentifiable bones (in the NISP column) for Feature 1, Test Unit 2, 5LA4417.

Taxon	Total Counts of Specimens	MNI
Unidentified Rodentia	1	N/A
Unidentified small mammal	1	N/A
Unidentified small to medium mammal	1	N/A
Unidentifiable bone	37	N/A
Total	40	N/A

Feature 1 (Test Unit 4): Test Unit 4, also located within Feature 1 and a several meters northwest of Test Unit 2, contained 20 unidentifiable bones and one identifiable bone: a caudal vertebra of a small mammal (see Table 6). Fifteen of the 20 unidentifiable bones were burned and vary from slightly smoked and gray to completely calcined.

Table 6. Taxon NISP and MNI including total counts for unidentifiable bones (in the NISP column) for Feature 1, Test Unit 4, 5LA4417.

Taxon	NISP	MNI
Unidentified small mammal	1	N/A
Unidentifiable bone	20	N/A
Total	21	N/A

Feature 5 (Rooms 1 and 2, Test Units 1, 5, and 7):

Room 1, Feature 5 (Test Units 1 and 7): Test Units 1 and 7, located in Room 1 of Feature 5, had a total of thirteen unidentifiable bone specimens (see Table 7), one of which was burned to a gray color, and four that were burned to a dark gray color. Also found within Test Unit 1 was one bone specimen that is now missing and is not included in this analysis.

Table 7. Total counts of specimens recovered from Test Units 1 and 7.

Test Unit	Number of Specimens
Test Unit 1	7
Test Unit 7	2
Test Unit 1/Test Unit 7	4
Total	13

Room 2, Feature 5 (Test Unit 5): Test Unit 5, located in Room 2 of Feature 5 contained the largest quantity of specimens from 5LA4417. One hundred and sixty-six specimens were retrieved from this unit, 39 of which are identifiable to some degree (see Table 8).

Specimens identifiable to species are the distal end of a burnt (black) *Sylvilagus sp.* metapodial, the distal halves of both left and right humeri from the *Geomyidae sp.*, the right, burnt (black) proximal end of a small bird's humerus, and the right humerus of a bird that is similar in size and morphology to the Bobwhite Quail (*Colinus virginianus*) in Gilbert et al. (1985:91). Those specimens identifiable to Rodentia were a humerus fragment, a left humerus, a tibia/fibula, a long bone, and a pelvis. The left humerus shows signs of having been manipulated by the teeth and/or claws of carnivores/scavengers. Identifiable only to Vertebrate are four vertebra fragments that are too small and poorly preserved to determine beyond Vertebrate. Those specimens identified to small mammal from Test Unit 5 consist of an astragalus, a metapodial, a pelvis fragment, a calcaneous, a right humerus fragment, a right and a left humeri, nine teeth, and both a left and right mandible. The left and right mandibles belong to the same species and the nine teeth appear to belong to these specimens as well. Unfortunately, the comparative collection used does not allow for the determination of the species of these remains. Specimens belonging to unidentified small to medium-sized mammals are one third phalanx (claw bone), two long bone fragments, and three phalanges.

Table 8. Taxon NISP and MNI including total counts for unidentifiable bones (in the NISP column) for Test Unit 5, 5LA4417.

Taxon	NISP	MNI
Geomyidae sp. (pocket gopher)	2	1
Sylvilagus sp. (cottontail rabbit)	1	1
Aves (bird)	2	2
Unidentified Rodentia	5	N/A
Unidentified Vertebrate	4	N/A
Unidentified small mammal	19	N/A
Unidentified small to medium mammal	6	N/A
Unidentifiable bone	127	N/A
Total	166	4

Twenty-one of the unidentifiable bones were burned, mostly of limited degree but some are dark grey in color. It is not known if the burning is from cultural or natural causes.

A culturally modified bone was recovered from Layer 2, Level 3 of Test Unit 5. This is a broken tubular bone bead (see Figure 2) that is polished and has cutmarks near the ends. The bead was made from a tibia-fibula bone from a cottontail rabbit (*Sylvilagus sp.*) or a mammal of similar or slightly smaller size. The bead is thirteen millimeters in length, and due to a break along this entire length only half of the bead is present. It appears that both ends of the bead "were cut by annular scoring of bone shafts until the extremities could be cleanly snapped off" (Morris and Burgh 1954:63).

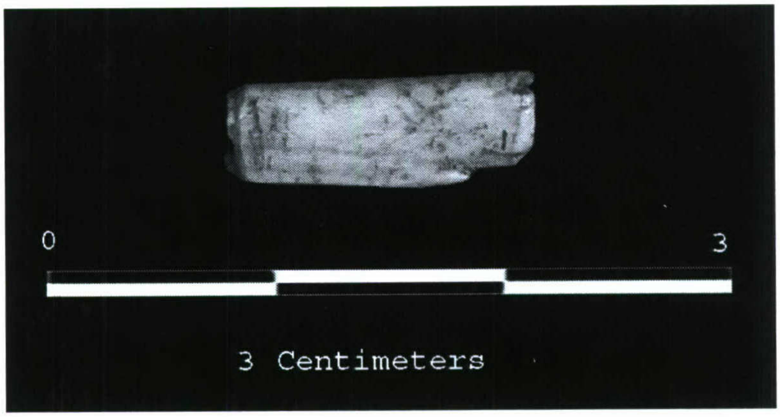


Figure 2. Bone bead from Test Unit 5, 5LA4417.

Conclusions, 5LA4417

The sample from 5LA4417 is quite small and many of the remains could be accounted for by postdepositional intrusions. However, it is still possible that much of the rodent and small mammal remains were in some way utilized by the site's inhabitants during occupation. The number of burned specimens (69 specimens, or 28.75% of the site's assemblage) may be indicative of activities conducted by humans, but also may be evidence of previous wildfires. Similarly, the bone specimen from Feature 1 (Test Unit 2) may be evidence for people utilizing their resources, although it may also be evidence of carnivorous activity, instead. The only specimen here that is definite proof of people interacting with the fauna around them is the tubular bone bead found from within Test Unit 5. It is possible that the testing completed during the 2003 season by FLC at this site did not encounter the disposal area of the prehistoric inhabitants' food remains, despite the fact that testing was done in the area thought to be the midden.

5LA5612

This prehistoric site yielded 593 specimens, 69 of which are identifiable (Table 1). Specimens were recovered from Test Units 1 and 2 as well as Shovel Test Pits 26, 29, 40, 41, 42, and 44 (see Table 9).

Shovel Test Pits: Twelve fragments of bone, all of which are unidentifiable, were collected from six of the 46 shovel test pits (see Table 10). One specimen, recovered from Shovel Test Pit 26, appears to be heavily weathered. The five specimens located within Shovel Test Pit 29 were all burned, four are only slightly gray while one is very black. The specimen from Shovel Test Pit 40 was burnt black. It appears to be polished and has some marks from an unknown process. All three specimens from Shovel Test Pit 44 appear to be in poor condition and are heavily weathered.

Table 9. Total quantities and percentages for 5LA5612's faunal assemblage, including the total counts for all unidentifiable bones.

Location	Total Number of Specimens	Percent of Site's Total Assemblage
Shovel Test Pit 26	1	0.17
Shovel Test Pit 29	5	0.84
Shovel Test Pit 40	1	0.17
Shovel Test Pit 41	1	0.17
Shovel Test Pit 42	1	0.17
Shovel Test Pit 44	3	0.51
Test Unit 1	284	47.89
Test Unit 2	297	50.08
Total	593	100

Table 10. Specimens recovered from Shovel Test Pits from site 5LA5612, all of which were unidentifiable.

Shovel Test Pit Number	Depth Below Ground Surface	Stratum	Quantity	Burned
Shovel Test Pit 26	40-50 cm	Stratum III	1	No
Shovel Test Pit 29	50-60 cm	Stratum III	5	Yes
Shovel Test Pit 40	20-30 cm	Strata II/III	1	Yes
Shovel Test Pit 41	20-25 cm	Stratum III	1	No
Shovel Test Pit 42	0-10 cm	Strata I/II	1	No
Shovel Test Pit 44	0-07 cm	Stratum I	3	No
Total			12	

Test Unit 1: Two-hundred and eighty-four specimens were recovered from Test Unit 1, 32 of which are in some way identifiable (see Table 11). The distal end of a burnt, left humerus belonging to the Sciuridae family (squirrel) was recovered. Also identified was one left carpometacarpus and one left humerus belonging to two different bird (Aves) individuals (seen in the fact that the carpometacarpus is much too large to belong to the same individual as the small humerus). The vertebra of an Order Caudata (salamander) individual was identified, and looks most like *Ambystoma tigrinum* (Tiger Salamander) in Olsen (1968:75). One frog/toad tibiofibula as well as one amphibian mandible fragment, three amphibian jaw fragments, and two amphibian vertebrae were also identified from Test Unit 1. Test Unit 1 was located near a drainage and roughly 20 meters southwest of a catchment area which may account for such vertebrate remains. Three long bone fragments were recovered that could only be assigned to Rodentia, and seven vertebrae that could only be identified to Vertebrate were also recovered. They are most likely rodent or amphibian remains. Two metapodials and a long bone fragment belong to the small mammal category. Two phalanges, a long bone fragment, one caudal vertebra, a metapodial, and the proximal half of a humerus belong to the small to medium sized mammal category. The proximal half of a small to medium sized

mammal's humerus has polishing from an unknown cause and exhibits what may be a carnivore/scavenger tooth puncture near the proximal end. One tooth fragment was assigned to the medium sized mammal category and a tooth fragment was assigned to large mammal.

Table 11. Taxon NISP and MNI including total counts for all unidentifiable bones (in the NISP column) for Test Unit 1, 5LA5612.

Taxon	NISP	MNI
Sciuridae family (squirrel and relatives)	1	1
Order Anura (frogs and toads)	1	1
Order Caudata (salamander)	1	1
Aves (bird)	2	2
Unidentified Amphibia	6	N/A
Unidentified Rodentia	3	N/A
Unidentified Vertebrate	7	N/A
Unidentified small mammal	3	N/A
Unidentified small to medium mammal	6	N/A
Unidentified medium mammal	1	N/A
Unidentified large mammal	1	N/A
Unidentifiable bone	252	N/A
Total	284	5

Seventy-two of the unidentifiable fragments were burned and range in color from light gray to blue to white.

Test Unit 2: Test Unit 2 included 297 specimens, 37 of which are in some way identifiable (see Table 12). The distal end of a right, burnt (dark gray) *Sylvilagus sp.* humerus, the distal end of a right *Neotema sp.* humerus, the distal half of a small bird humerus, a frog/toad tibiofibula and urostyle, two amphibian vertebrae, as well as one amphibian maxilla fragment and one amphibian jaw fragment were all identified from Test Unit 2. This unit was also placed near a drainage and just south of a catchment so these amphibian remains could have been naturally deposited. Two rodent vertebrae, a rodent radius, and one rodent femur were also identified. Seven vertebrae were classified only to Vertebrate and probably belong to amphibians or rodents. A calcaneus, two phalanges, an acetabulum from a pelvis, one metapodial, and three humeri were classified as small mammal remains. One of the three humeri has a small red stain (6 mm. in length and 1 mm. breadth) on the shaft from an unknown source. Three caudal vertebrae, one metapodial, and a jaw fragment belong to unidentified small- to medium-sized mammals, and two teeth fragments as well as two third phalanges (claw bones) belong to medium-sized mammals.

Thirty-one of the 260 unidentifiable bones were burned and range in color from light gray to dark black.

Table 12. Taxon NISP and MNI including total counts for unidentifiable specimens (in the NISP column) from Test Unit 2, 5LA5612.

Taxon	NISP	MNI
Neotema sp. (woodrat)	1	1
Sylvilagus sp. (cottontail rabbit)	1	1
Aves (bird)	1	1
Order Anura (frogs and toads)	2	1
Class Amphibia (amphibian)	4	N/A
Unidentified Rodentia	4	N/A
Unidentified Vertebrate	7	N/A
Unidentified small mammal	8	N/A
Unidentified small to medium mammal	5	N/A
Unidentified medium mammal	4	N/A
Unidentifiable bone	260	N/A
Total	297	4

Conclusions, 5LA5612

Despite the fact that 593 specimens were recovered from 5LA5612, and that 69 of them were identifiable, little conclusive evidence can be gained about cultural relationships, either between the inhabitants and the environment or between the inhabitants and any features. Of the 593 specimens from this site, 111 were burned, equaling 18.72% of the site's faunal assemblage. This burning may be evidence of human manipulation or of wildfires, although the burnt squirrel and cottontail humeri could definitely be the result of human activities. However, much of the assemblage from the site can be just as easily explained as having accumulated naturally. Though the inhabitants could have been taking advantage of these resources in various ways, the two test units excavated were located near a drainage and just south of a catchment. Thus, the frog, salamander, and various other amphibian remains may have accumulated from the natural environment. There is no evidence of specific human manipulation, in the form of butchering marks, tool or ornament production, etc..

5LA06108

This historic site, which contains a prehistoric component, yielded the greatest amount of faunal materials from the four sites represented within this analysis. A total of 668 bones were recovered and 141 were in some way identifiable (see Tables 1 and 13). Faunal remains were found throughout the site in both historic and prehistoric features but were rarely found within extramural test units. Signs of burning, butchering, carnivore gnawing and human modification are present on a number of the specimens.

Table 13. Total quantities and percentages for 5LA6108's faunal assemblage, including the total counts for all unidentifiable bones.

Location	Total Counts of Specimens	Percent of Site's Total Assemblage
Feature 1/Test Unit 18	7	1.05
Feature 2/Test Unit 23	109	16.32
Feature 5/Test Unit 10	414	61.98
Feature 7/Test Unit 11	19	2.84
Feature 7/Test Unit 15	5	0.75
Feature 8/Test Unit 7	1	0.15
Feature 9/Test Unit 21	38	5.69
Feature 15/Test Unit 4	3	0.45
Hearth 1	48	7.19
Test Unit 2	7	1.05
Test Unit 6	16	2.40
Test Unit 16	1	0.15
Total	668	100

Feature 1 (Test Unit 18): Test Unit 18 had seven faunal specimens within it, five of which are identifiable (see Table 14). The majority of the faunal remains recovered from Feature 1 were collected from the overburden sediments, wherein the excavators noted that there were large amounts of rodent feces. Found in this overburden was a tibia-fibula and the left humerus of the *Neotema sp.*, the right humerus of an unidentified rodent, and two burned unidentifiable specimens. The rodent remains are probably of a natural rather than cultural origin. Found within this test unit below the overburden was the right, distal half of a *Neotema sp.* humerus and a long bone fragment of an unidentified small to medium sized mammal.

Table 14. Taxon NISP, MNI, and total count of unidentifiable bones (in the NISP column) from Feature 1, Test Unit 18 at 5LA6108.

Taxon	NISP	MNI
Neotema sp. (woodrat)	3	1
Unidentified Rodentia	1	1
Unidentified small to medium mammal	1	1
Unidentifiable bone	2	N/A
Total	7	4

Feature 2 (Test Unit 23): Testing was conducted within each of the three rooms of Feature 2 (Test Units 17, 23, and 24), but Test Unit 23 was the only one that contained faunal remains. One hundred and nine unidentifiable specimens were recovered from this test unit, all of which were burned.

<u>Feature 5 (Test Unit 10):</u> Test Unit 10 yielded the largest number of bones from any feature excavated during the FLC 2003 field season. However, many of the specimens may represent only one individual (see Table 15). Four-hundred and fourteen bones were recovered from the feature, 89 of which were in some way identifiable. Ten of these specimens belong to a *Mephitis mephitis*, or striped skunk, and probably represent only a single individual). The remains belonging to the striped skunk are the proximal end of a left humerus, seven teeth, a burnt astragalus, an axis, an atlas, the left and right mandibles, a condyle of the left mandible, the occipital lobe of the skull, and the oral half of the skull. In addition, many or all of the twenty ribs and twenty-four vertebrae that were here only assigned to small-to-medium or medium- sized mammals likely belong to this individual (however, there are not any assumptions regarding the other remains only identified to small-to-medium or medium-sized mammals recovered during the excavation of Test Unit 10).

Table 15. Taxon NISP, MNI and total count of unidentifiable bones (in the NISP column) for Feature 5, Test Unit 10 at 5LA6108.

Taxon	NISP	MNI
Onychomys sp. (northern grasshopper mouse)	1	1
Sylvilagus sp. (cottontail rabbit)	1	1
Mephitis mephitis (striped skunk)	10	1
Taxidea taxus (badger)	1	1
Canis latrans (coyote)	1	1
Equus caballus (horse)	2	1
Pisces (fish)	1	1
Unidentified Rodentia	4	N/A
Unidentified Vertebrate	1	N/A
Unidentified small mammal	1	N/A
Unidentified small to medium mammal	25	N/A
Unidentified medium mammal	37	N/A
Unidentified medium to large mammal	4	N/A
Unidentifiable bone	325	N/A
Total	414	7

Since striped skunks do not hibernate but still take advantage of denning sites, it is highly possible that this individual was placed into the deposits naturally after creating a denning site within the feature. However, since it is also known that striped skunks have been trapped and raised for their pelts, there is the possibility that the remains of a manipulated skunk were discarded into Feature 5 during historic times. According to Binford (1981), "there are actually very few places on the anatomy where the manipulation of the skin brings the butcher in direct contact with bone. The two places where it is most likely are the lower legs and the head" (Binford 1981:106-107). None of the *Mephitis mephitis* specimens from Feature 5 appear to have any evidence of being manipulated during the skinning process, so it is unknown whether this skunk was placed into the deposits of Feature 5 by natural or cultural forces. Also, there is no easy explanation for the astragalus being burnt.

In addition to the striped skunk, a variety of specimens were identified from within Feature 5. These include the right scapula of a *Sylvilagus sp.*, the bacula of a *Taxidea taxus* (badger) male, the second molar from the right, lower mandible of a *Canis latrans* (coyote) individual, a fish vertebra, and the left pelvis of the *Onychomys sp.* (northern grasshopper mouse). Two horse teeth (the second premolar from the top, right side and the fourth premolar from the top, left side) were identified and have been classified as belonging to one or two older individuals. When measurements of the crowns were referenced to Levine (1982:234-235), it was determined that the teeth were from one or two individuals who were roughly eleven years in age (the MNI assigned here was one). In addition, a skull, vertebra, scapula, and left mandible were each classified as unidentified Rodentia.

One vertebra fragment could not safely be identified as Mammalia, so it has been classified as an unknown small Vertebrate. A small mammal pelvis fragment was identified. Assigned to small-to-medium mammals were twenty ribs, three skull fragments (one of which includes a zygomatic arch), a vertebra fragment, and a metapodial. The unidentified medium mammal collection consists of nine lumbar vertebrae, three cervical vertebrae, ten thoracic vertebrae, one naviculo-cuboid, one phalanx, a skull fragment, one scapula fragment, two caudal vertebrae, two unidentifiable vertebrae fragments, and the distal half of a radius. This radius appears to have been manipulated, as there is polishing at the break (which is a spiral break) on the shaft. Polishing on the break of a bone may be from a variety of sources such as carnivore/scavenger modification (Binford 1981), trampling (Agenbroad 1989), antemortem movement on a broken bone (which would cause bone on bone movements), or even water transport (Marshall 1989:20). There is no evidence leading to any conclusion as to what specifically caused this specimen's polishing. Also identified to medium sized mammal are four phalanges and two metapodials that probably belong to the Canis species and are smaller than a coyote. The four bones belonging to the medium-to-large mammal category are all caudal vertebrae. As mentioned above, many of the unidentifiable mammal remains likely belong to the skeleton of the striped skunk.

Three-hundred and twenty-five bones collected from Feature 5 were unidentifiable. Two-hundred and ninety-six of these show no sign of burning, while 29 were burned. The burning of these bones ranges from slight to calcined. One of the non-burned bones has signs of polishing along half of the bone and one of the fragment's ends. Again, this polishing could have occurred from a variety of causes and there are no definitive explenations as to which specific process caused the polishing.

Eleven bones were also identified within a macrobotanical sample (see Appendix II). The macrobotanical analyst concluded that seven unburned fragments belong to a rabbit and four unburned fragments belong to a rodent. These bones were not identified by the author and will therefore not be represented within this analysis.

<u>Feature 7 (Test Units 11 and 15):</u> A total of 24 faunal specimens were collected from within this feature. Of these, eleven were in some way identifiable (see Tables 16 and 17). A right pelvis, radius, left femur, and ulna belonging to the *Sylvilagus sp.* were identified. These possibly all belong to the same individual. The femur has what appears to be manipulation along the entire posterior side of the shaft and the pelvis has three puncture wounds all resulting from the gnawing of a small carnivore/scavenger such as a rodent. The gnawing marks on the femur extend to the distal end of the shaft hinting at the possibility that the distal end may be missing as a result of complete destruction due to the manipulation. A phalanx of a *Taxidea taxis* (badger), the left half of a Sciuridae family (squirrel) pelvis, two large mammal vertebra, two fragments of teeth from a medium to large sized mammal, and a tooth/jaw fragment from a medium sized mammal were also identified from Feature 7. Eleven

specimen were unidentifiable and not burned, while two bones were burned and unidentifiable.

Table 16. Taxon NISP, MNI and total count of unidentifiable bones (in the NISP column) from Feature 7, Test Unit 11 at 5LA6108.

Taxon	NISP	MNI
Sylvilagus sp. (cottontail rabbit)	4	1
Taxidea taxus (badger)	1	1
Unidentified large mammal	2	N/A
Unidentifiable bone	12	N/A
Total	19	2

Table 17. Taxon NISP, MNI and total count of unidentifiable bones (in the NISP column) from Feature 7, Test Unit 15 at 5LA6108.

Taxon	NISP	MNI
Sciuridae family (squirrels and relatives)	1	1
Unidentified medium mammal	1	N/A
Unidentified medium to large mammal	2	N/A
Unidentifiable bone	1	N/A
Total	5	1

Feature 8 (Test Unit 7): Feature 8 provided the sample with only one bone. This is the distal end and roughly 12 centimeters of the shaft of a right tibia of a wapiti (*Cervus Canadensis*) (see Figure 3), which is also the largest bone found within the site. The specimen was located deep within Feature 8 and it is unclear whether the specific sediments were deposited prehistorically or historically, as no indicative artifacts were associated with the faunal specimen.

The bone is broken with a spiral break, which was once thought to be definitive of hominid manipulation. Now there is evidence that this type of break simply means that the bone was broken when the it was in a fresh (or green) state (Agenbroad 1989:141; Binford 1981:38, 148; Hill 1989:174; Johnson 1989:433; Marshall 1989:14). It is now known that "natural processes can, and do, produce spirally fractured bone" (Agenbroad 1989:145). Those processes that can create spiral breaks include "trampling, rock fall, entrance fall, carnivore gnawing and mastication, water transport, accident during life of animal, cryoturbation, diagenic movements, volcanic shock waves, [and] marrow processing by hominids" (Marshall 1989:15).

Figure 3. The distal end of an elk's tibia. Note the spiral break, cut marks at the break, and two fresh perforations that were caused during the excavation.

There are possible manmade cutmarks near the break of the bone and these are believed to be cutmarks rather than marks made by a carnivore due to their V-shape in cross-section and their location within a cluster, two characteristics that are typical of, but not limited to, manipulation done by human tools (Marshall 1989:17; Gifford-Gonzalez 1989, Figure 7). It is possible that a human broke this bone to reach the marrow-rich insides, either prehistorically or historically.

In addition, there is one slight scoring (Binford 1981:44-55) mark on the shaft of the bone, which may have been made by a carnivore/scavenger as it is U-shaped in cross-section (Marshall 1989:18), but it is too shallow to tell. The bone also reveals "step fractures" (Binford 1981:44-55) along the break which *can* be created by carnivore manipulation, but there is no polishing along the break or on the step fractures to indicate intense gnawing. It could be argued that this bone was manipulated by a carnivore because the proximal end of the tibia is one of the most common victims to carnivore gnawing and complete destruction (Binford 1981:76; Oliver 1989:81), while the distal end is less often manipulated and "is commonly left articulated with the tarsals" (Binford 1981:76). However, if carnivore damage is present, it is of a minimal degree. Two puncture wounds are also visible on the shaft and are probably secondary breaks, having been accidentally produced by the excavators (Marshall 1989:11).

A conclusion is hard to reach in spite of evidence for the manipulation by a human because "if a pattern in a bone assemblage is surely known to result from multiple processes, then caution must be observed in inferring a process-pattern relationship" (Marshall 1989:14). Spiral fractures, V-shaped marks, and U-shaped marks are not unique to manipulation caused by humans, nature, or carnivores. With caution, then, it can be said that the bone was probably broken in an attempt to reach the marrow by a human, and a carnivore or scavenger may have minimally manipulated it afterwards.

<u>Feature 9 (Test Unit 21):</u> Feature 9 yielded 38 pieces of bone, 25 of which were identifiable (see Table 18). Thirteen of the identifiable specimens belonged to *Sylvilagus sp.*: three right tibias, one left tibia and it's associated distal epiphysis (unfused to the shaft), an ulna, a radius, a metapodial, two calcanei, the distal end of a humerus, a skull fragment, and an occipital lobe. An additional seven specimens probably belong to the *Sylvilagus sp.*: one metatarsus, four phalanges, and two long bones that may be cottontail radii (here assigned to small mammal). There are at least three cottontail rabbits present

here (MNI), determined by the three right distal halves of tibias.

Table 18. Taxon NISP, MNI and total count of unidentifiable bones (in the NISP column) for Feature 9, Test Unit 21 of 5LA6108.

Taxon	NISP	MNI
Sylvilagus sp. (cottontail rabbit)	13	3
Class Aves (bird)	1	1
Unidentified small mammal	7	N/A
Unidentified small to medium mammal	2	N/A
Unidentified medium mammal	1	N/A
Unidentified large mammal	1	N/A
Unidentifiable bone	13	N/A
Total	38	4

Much of the cottontail remains appear to be modified in some way. The shaft of the left tibia has an irregular, perpendicular break (as classified by Marshall 1998:14) that may have been caused by a human cutting the bone. One of the right tibias has some polishing present and a possible cutmark. Another of the right tibias has some polishing and some carnivore/scavenger gnawing. One calcaneous has a mark along most of the caudal side that is from an unknown process, and the other calcaneous has two marks from an unknown source. One of the possible cottontail radii has what may be two cutmarks on the shaft. Most of the cottontail remains have some degree of polishing present.

It can probably be concluded that these cottontail remains represent pieces discarded by humans during the butchering process, since cutmarks and deliberate breaks are present on some of the fragments. The lower extremities and skulls may have been removed during the process of butchering for meat or for fur. Another hypothesis is that the bones of the extremities were broken during the process of the individuals being caught in a trap. Whatever the cause, it is here a safe conclusion to infer human interaction.

A humerus of an unknown bird species was found within this feature as well and the proximal end has some minimal carnivore/scavenger gnawing. Also notable is the phalanx of a medium mammal that shows signs of traumatic stress, injury, or disease as it is curved into the shape of a loose "s". An unidentified large-mammal rib (which has extensive root etching on its surface), and two unidentified small-to-medium-sized mammal phalanges were also recovered.

Thirteen unidentifiable bones were collected, some being very small fragments and three belonging to a large mammal. One of the small fragments and one of the large fragments contain carnivore/scavenger gnawing marks. Eleven of the unidentifiable bones are not burned and two are burned.

Feature 15 (Tests Unit 4): The excavation of Test Unit 4 provided the faunal assemblage with one unidentifiable bone, one vertebra identifiable only to Vertebrate, and

a tooth from a *Neotema sp.* (woodrat) individual (see Table 19).

Table 19. Taxon NISP, MNI and total count of unidentifiable bone (in the NISP column) for Feature 15, Test Unit 4 of 5LA6108.

Taxon	NISP	MNI
Neotema sp. (woodrat)	1	1
Unidentified *Vertebrate*	1	N/A
Unidentifiable bone	1	N/A
Total	3	1

<u>Hearth 1, Test Unit 2 and Test Unit 6:</u> Test Unit 2 contained one burnt unidentifiable bone (that is hollow and may be a fragment from a bird long bone) and five unidentifiable bones that are not burned (see Table 20). Most notable, though, is a tubular bone bead that was located within this unit. This bone artifact is thirteen millimeters in length, is burnt, and contains various cutmarks near each end (see Figure 4).

Table 20: Taxon NISP, MNI and total count of unidentifiable bones (in the NISP column) from Test Unit 2, Test Unit 6, and Hearth 1 from 5LA6108.

Location	Taxon	NISP	MNI
Test Unit 2	Unidentifiable bone	7	N/A
Test Unit 6	Unidentifiable bone	16	N/A
Hearth 1	*Neotema sp.* (woodrat)	1	1
	Unidentified small mammal	2	N/A
	Unidentified small to medium mammal	1	N/A
	Unidentifiable bone	44	N/A
Total		71	1

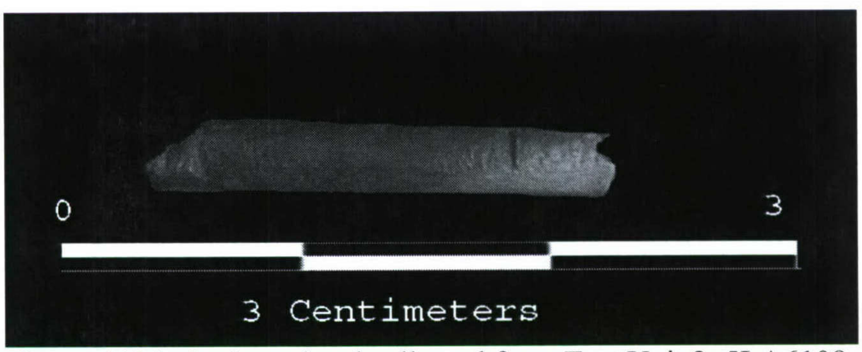


Figure 4.Tubular bone bead collected from Test Unit 2, 5LA6108.

Test Unit 6 contained one piece of unidentifiable bone that was not burned, twelve burnt pieces of unidentifiable bone, and three burnt, polished pieces of unidentifiable bone (see Table 20).

Hearth 1 had thirteen unidentifiable bones that were not burned and thirty-one burned unidentifiable bones. Unworked identifiable specimens were one tooth belonging to a rodent of the *Neotema* species and a burnt astragalus from a small to medium sized mammal (see Table 20).

Also found within the hearth were two bones that had been culturally modified. One is a broken, burnt shaft of a tibia belonging to a small mammal, possibly a cottontail (see Figure 5). The distal end of this specimen was broken in a way similar to the bead located in Test Unit 5 at 5LA4417. Once again, it appears that it was "cut by annular scoring of [the] bone shafts until the extremities could be cleanly snapped off" (Morris and Burgh 1954:63). This shaft fragment may have been a failed attempt at a bead. The other modified specimen was the proximal end of a tibia belonging to a mammal smaller than a cottontail (see Figure 6). The distal end of this bone was broken in the same manner and this proximal end is probably a discarded portion of the element during the bead making process.

Figure 5. Broken Tubular bead located within Hearth 1, 5LA6108.

Figure 6. Proximal end of a mammal tibia, modified during the bead making process.

Test Unit 16: One unidentifiable specimen was recovered from this extramural test unit.

Conclusions, 5LA6108

This site possessed clear evidence for direct interaction between humans and the fauna surrounding them. There is evidence of at least three cottontail, one elk, and possibly a striped skunk that were culturally manipulated during the historic occupation of the site. The cottontail were probably exploited due to their high population numbers and the fact that they were easy to procure and were wanted for their meat, fat, and fur. The elk was probably similarly procured for its meat, marrow and fat, and hide, but it is unclear whether this occurred prehistorically or historically. The skunk, if it entered the feature during habitation, may have been discarded after having been killed for either being a nuisance or for its valuable fur.

Prehistorically, this site reveals evidence that small and small-to-medium-sized mammals were being procured to produce bone beads/tubes.

In addition, this site reveals just how difficult it can be to make the distinction between human modified and naturally modified faunal specimens, even when there is significant modification on the bones. The assemblage also is evidence for the many factors that affect a faunal specimen before and after burial: manipulation by human or carnivore in the form of cutting, chewing, or burning; manipulation as a result of being abraded or polished during and after burial; manipulation by extensive root systems; and manipulation as a result of the excavator's tools.

Summary Discussion

There is much to be learned from a large faunal sample that is carefully analyzed and interpreted. The analyst can come to educated hypotheses, for instance, about people's rituals, environment, diet, and class organization. However, the assemblage represented in this specific analysis is hardly a large sample. While this analysis was conducted in hopes of determining the cultural relationship that the inhabitants of these four sites had with the fauna around them, at best we may catch only a glimpse of their interactions. The assemblages from the four sites tested during the 2003 field season by FLC contain *at least* one fish, one salamander, two frogs or toads, one grasshopper mouse, one rodent belonging to the pocket gopher species, two individuals belonging to the woodrat species, two individuals belonging to the squirrel family, six birds, six cottontail rabbits, one striped skunk, one badger, one coyote, one horse, and one elk (see Table 21). In addition, the total assemblage contains various other small, medium, and large mammal remains, numerous unidentified rodents, and various amphibian remains.

Table 21. All identified taxon represented within the assemblages from 5LA3333, 5LA4417, 5LA5612, and 5LA6108. The results are here organized by taxon.

Taxon	Site	NISP Total from Site	MNI Total from Site
Neotema sp. (woodrat)	5LA5612	1	1
	5LA6108	5	1
Total		6	2
Geomyidae sp. (pocket	5LA4417	1	1
Total		1	1
Onychomys sp. (Northern	5LA6108	1	1
Total		1	1
Sciuridae family (squirrels	5LA5612	1	1
	5LA6108	1	1
Total		2	2
Sylvilagus sp. (cottontail	5LA3333	1	1
	5LA4417	1	1
	5LA5612	1	1
	5LA6108	18	3
Total		21	6
Mephitis mephitis (striped	5LA6108	1	1
Total		1	1
Taxidea taxus (badger)	5LA6108	2	1
Total		2	1
Canis latrans (coyote)	5LA6108	1	1
Total		1	1
Cervus canadensis (elk)	5LA6108	1	1
Total		1	1
Equus caballus (horse)	5LA6108	1	1
Total		1	1
Pisces (fish)	5LA6108	1	1
Total		1	1
Anura (frogs and toads)	5LA5612	3	2
Total		3	2
Caudata (salamanders)	5LA5612	1	1
Total		1	1
Aves (birds)	5LA4417	2	2
	5LA5612	3	3
	5LA6108	1	1
Total		6	6
Assemblage Total		59	27

References Cited

Agenbroad, Larry D.
1989 Spiral Fractured Mammoth Bone from Nonhuman Taphonomic Processes at Hot Springs Mammoth Site. In *Bone Modification*, edited by Robson Bonnichsen and Marcella H. Sorg, pp. 139-147. Center for the Study of the First Americans. Thompson-Shore, Inc. Dexter, MI.

Allaire, Maria.
ND *A Comparative Skeletal Study and Field Guide for the Mule Deer, Jackrabbit, Cottontail and Turkey*. Manuscript On File, Department of Anthropology, Fort Lewis College, Durango, CO.

Armstrong, David M.
1993 *Lions, Ferrets and Bears: A Guide to the Mammals of Colorado*. Colorado Division of Wildlife. University of Colorado Museum, Boulder, CO.

Bauer, Erwin A.
1995 *Elk: Behavior, Ecology, Conservation*. Voyageur Press, Inc. Stillwater, MN.

Binford, Lewis R..
1981 *Bones: Ancient Men and Modern Myths*. Academic Press, New York.

Brown, Christopher L. and Carl E. Gustafson.
1979 *A Key to Postcranial Skeletal Remains of Cattle/Bison, Elk and Horse*. Laboratory of Anthropology, Washington State University, Pullman.

Brown, Marie E.
1993 Chapter 14: Natural History and Ethnographic Background. In *Across the Colorado Plateau: Anthropological Studies for the Transwestern Pipeline Expansion Project Vol. XV Part 2*. Pp. 275-326. Office of Contract Archaeology and Maxwell Museum of Anthropology. University of New Mexico, Albuquerque, NM.

Brown, Marie E., Kenneth L. Brown, and Martha Binford.
2004 Chapter 24: Faunal Analysis. In *Guardian of the Trail: Archaeological and Historical Investigations at Fort Craig*, edited by Peggy A. Gerow, pp. 285-318. Cultural Resources Series No. 15. New Mexico Bureau of Land Management.

Buikstra, Jane E. and Mark Swegle.
1989 Bone Modification Due to Burning: Experimental Evidence. In *Bone Modification*, edited by Robson Bonnichsen and Marcella H. Sorg, pp. 247-258. Center for the Study of the First Americans. Thompson-Shore, Inc. Dexter, MI.

Burt, William H.
1960 *Bacula of North American Mammals*. Miscellaneous Publications. Museum of Zoology, University of Michigan, No. 113. Ann Arbor, Michigan.

Burt, William H. and Richard P. Grossenheider.
1980 *A Field Guide to the Mammals: North America north of Mexico*. Third Edition. The Peterson Field Guide Series. Houghton Mifflin Company, Boston, MA.

Dean, J. Claire (editor and compiler)
1992 *Guidelines to Required Procedures for Archaeological Field and Laboratory Work at Pinon Canyon Maneuver Site Las Animas County, Colorado*. Department of Anthropology. University of North Dakota. Grand Forks, ND.

Driesch, Angela von den
1976 *A Guide to the Measurement of Animal Bones From Archaeological Sites*. Peabody Museum, Harvard University, Cambridge.

Fitzgerald, James P., Carron A. Meaney, and David M. Armstrong.
1994 *Mammals of Colorado*. Denver Museum of Natural History and University Press of Colorado. University Press of Colorado, Niwot, CO.

Gese, E. M., O. J. Rongstad, and W. R. Mytton
1988 "Relationship between coyote group size and diet in southeastern Colorado". *Journal of Wildlife Management*, 52:647-653.

Gier, H. T.
1975 Ecology and behavior of the coyote (Canis latrans). In *The wild canids: their systematics, behavioral ecology and evolution,* edited by M. W. Fox, pp. 247-262. Van Nostrand Reinhold, NY.

Gilbert, B. Miles, Larry D. Martin and Howard G. Savage.
1985 *Avian Osteology*. Modern Printing Co., Laramie, WY.

Gifford-Gonzalez, Diane.
1989 Ethnographic Analogues for Interpreting Modified Bones: Some Cases from East Africa. In *Bone Modification*, edited by Robson Bonnichsen and Marcella H. Sorg, pp. 179-246. Center for the Study of the First Americans. Thompson-Shore, Inc. Dexter, MI.

Grayson, Donald K.
1984 *Quantitative Zooarchaeology: Topics in the Analysis of Archaeological Faunas*. Academic Press, Inc. Orlando, FL.

Hill, Andrew.
1989 Bone Modification by Modern Spotted Hyenas. In *Bone Modification*, edited by Robson Bonnichsen and Marcella H. Sorg, pp. 169-178. Center for the Study of the First Americans. Thompson-Shore, Inc. Dexter, MI.

Hill, Erica.
2003 Appendix 1: Faunal Analysis of Vertebrate Faunal Materials From Six Southeastern Colorado Sites. In *Archaeological Investigations from 1998 at Six Sites on the Pinon Canyon Maneuver Site, Las Animas County, Colorado*, compiled by Vincent W. Schiavitti, pp. 55-80. Fort

Carson Cultural Resource Management Series Contribution Number 12. New Mexico State University, Las Cruces, NM.

Hillson, Simon.
1996 *Mammal Bones and Teeth: An Introductory Guide to Methods of Identification*. Institute of Archaeology, University College, London.

Johnson, Eileen.
1989 Human-modified Bones from Early Southern Plains Sites. In *Bone Modification*, edited by Robson Bonnichsen and Marcella H. Sorg, pp. 431-471. Center for the Study of the First Americans. Thompson-Shore, Inc. Dexter, MI.

Klein, Richard G. and Kathryn Cruz-Uribe.
1984 *The Analysis of Animal Bones from Archaeological Sites*. The University of Chicago Press, Chicago.

Lariviere, Serge, Lyle R. Walton, and Francois Messier.
1999 Selection by Striped Skunks (Mephitis mephitis) of Farmsteads and Buildings as Denning Sites. In *American Midland Naturalist* Vol. 142, Issue 1. 96-101.

Lechleitner, R. R.
1969 *Wild Mammals of Colorado: Their Appearance, Habits, Distribution, and Abundance*. Pruett Publishing Company. Boulder, Colorado.

Levine, Marsha A.
1982 The use of crown height measurements and eruption-wear sequences to age horse teeth. In *Ageing and Sexing Animal Bones from Archaeological Sites*, edited by Bob Wilson, Caroline Grigson and Sebastian Payne, pp. 223-250. BAR British Series 109. Oxford, England.

Marshall, Larry G.
1989 Bone Modification and 'The Laws of Burial'. In *Bone Modification*, edited by Robson Bonnichsen and Marcella H. Sorg, pp. 7-24. Center for the Study of the First Americans. Thompson-Shore, Inc. Dexter, MI.

Messick, J. P., M. C. Todd, and M. G. Hornocker
1981 Comparative ecology of two badger populations. Pp. 1290-1304, in *Proc. Worldwide Furbearer Conf* (J.A. Chapman and D. Pursley, eds.). Worldwide Furbearer Conf., Inc., Frostburg, MD.

Morris, Earl H. and Robert F. Burgh.
1954 *Basket Maker II Sites Near Durango, Colorado*. Publication 604. Carnegie Institution of Washington. Washington, D. C.

Oliver, James S.
1989 Analogues and Site Context: Bone Damages from Shield Trap Cave (24CB91), Carbon County, Montana, U.S.A.. In *Bone Modification*, edited by Robson Bonnichsen and Marcella H. Sorg, pp. 73-98. Center for the Study of the First Americans. Thompson-Shore, Inc. Dexter, MI.

Olsen, Stanley J.
1968 *Fish, Amphibian and Reptile Remains From Archaeological Sites. Part 1: Southeastern and Southwestern United States. Appendix: The Osteology of the Wild Turkey*. Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University, Volume LVI, No. 2. Cambridge, MA.

1973 *Mammal Remains From Archaeological Sites. Part 1: Southeastern and Southwestern United States*. Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University, Volume 56, No. 1. Cambridge, MA.

Rodeck, Hugo G.
N.D. *Guide to the Mammals of Colorado*. Second Printing. University of Colorado Museum Leaflets, Boulder, CO.

Schmid, Elisabeth.
1972 *Atlas of Animal Bones for Prehistorians, Archaeologists, and Quaternary Geologists*. Elsevier, Amsterdam.

Thomas, Jack Ward and Dale E. Toweill.
1982 *Elk of North America: Ecology and Management*. A Wildlife Management Institute Book. Stackpole Books. Harrisburg, Pa.

Wilber, C.G. and G.H. Weidenbacher
1961 Swimming Capacity of Some Wild Mammals. *Journal of Mammalogy* 42:428-429.

APPENDIX II

MACROFLORAL AND GASTROPOD IDENTIFICATION FROM THREE ARCHAEOLOGICAL SITES IN SOUTHEASTERN COLORADO: 5LA3333, 5LA5612 AND 5LA6108.

Prepared for:

Ms. Mona Charles
Ft. Lewis College
Department of Anthropology
1000 Rim Drive
Durango, Colorado 81301-3999

Prepared by:

Mr. Daniel R. Bach, RPA
High Plains Macrobotanical Services
912 Downey St.
Laramie, Wyoming 82072-1735

SEPTEMBER 10, 2004

Report #HPMS-22-2004

dan@macrofloral.com
www.macrofloral.com

Introduction:

Macrofloral identification was conducted on 14 light fraction samples, of which 11 samples were from an historic component at 5LA6108, two samples were from a prehistoric component at the same site and one historic sample from 5LA3333. Gastropod identification was conducted on four samples from 5LA5612 and two samples from 5LA3333.

Macrofloral results from the historic component at 5LA6108 yielded thousands of unburned strawberry (*Fragaria virginiana*) seeds, hundreds of unburned raspberry (*Rubus idaeus*) seeds and 22 complete and unburned grape (*Vitis riparia*) seeds. Also present were nine complete and unburned juniper (*Juniperus monosperma*) seeds and 14 seed fragments. One unburned and complete seed along with four unburned seed fragments from a cholla cactus (*Cylindropuntia imbricata*) were also present. Six unburned seeds from an unknown species from the composite family (sunflower family) were also recovered from 5LA06108. Macrobotanical remains included 1.43 grams of melted phytoliths (melted and fused grass silica) from a wall sample. Non-botanical remains included .09 grams of burned eggshell fragments which were recovered from the NW corner control sample. Also recovered in the light fraction were several unburned rabbit bone fragments and several unburned smaller bone fragments representing a rodent sized animal.

Macrofloral results from the prehistoric component at 5LA6108 yielded one charred and one unburned juniper (*Juniperus monosperma*) berry along with four charred and complete juniper seeds and 18 charred juniper seed fragments. Macrofloral results from 5LA3333 yielded one modern puffball (*Lycoperdon perlatum*).

Gastropod identification was conducted on four samples from 5LA5612 which yielded three species that included Multirib Vallonia (*Vallonia gracilicosta*), Rocky Mountain Dagger Snail (*Pupoides inoratus*) and several fragments from *Oxyloma* sp. gastropods. 5LA3333 yielded two species of gastropods which included White-Lip Dagger Snail (*Pupoides albilabris*) and Multirib Vallonia (*Vallonia gracilicosta*). None of the above species are good climatic indicators but rather represent terrestrial gastropods which live in conditions ranging from dry to damp areas and can be found in grasslands, shrublands and woodlands.

Methodology:

Ft. Lewis College floated the soil samples using an elutriator. An elutriator adds water from beneath the sample and separates or "floats" the organic matter free from its geologic host. The floated organic material was passed through a fine screen mesh (63 μm), collected and air dried. The heavy fraction was water screened through a 1.0 mm sieve. The material was air dried and examined for cultural (i.e., seeds, bone fragments, trade beads etc.) and non-cultural (gastropods) remains. These samples were sent to High Plains Macrobotanical Services. Several of the historic privy samples were re-floated because the

soils had not dispersed and released the botanical material. A 10% solution of sodium bicarbonate ($NaHCO_3$) per cc for each gram of soil was added along with hot tap water (Pearsall 1989:85). This solution sat for a 24 hour period and was then water screened through a fine mesh (63 µm) screen. This material was air dried. The light fraction was passed through a ¼", 2.0 mm, 1.0 mm and 500 µm sieves. Separating the light fraction into different sizes allows for more manageable viewing thereby decreasing the amount of time required to analyze a feature. The organic material was identified using a SWIFT stereo SM80 widefield microscope (10-40X). Recovered macrofloral materials were identified using the author's seed and charcoal collection and wood and seed identification manuals (i.e., Benson 1982; Core *et al.* 1979; Davis 1993; Hoadley 1990; Kirkbride *et al.* 2000; Martin and Barkley 2000; Musil 1978; Panshin and Zeeuw 1970; Young and Young 1992). Identification of the gastropods was accomplished using Rocque 1966, 1967, 1968, and1970.

Plant names are listed by both their common and scientific name. The term "sp." (such as *Pinus* sp.) indicates that the plant has been identified to the genus level but not to the species level. The term "seed" represents seeds, caryopses and achenes. Both scientific and common names are based on "Colorado Flora: Eastern Slope" by Weber 1990.

Ethnobotanical Review:

Harrington states, "Wild grapes are so commonly used in areas where they grow that little need be said about them. In general, they can be used in most of the various ways that their cultivated counterparts are utilized. The fruits are smaller of course, and may be more tart to the taste, but still they are grapes. Their commonest use is to make grape juice, wine or jelly" (Harrington 1967:295). They can also be eaten fresh. The same can be said for raspberries. They can be eaten fresh, made into a jelly or used in baking (Harrington 1967:276). Strawberries too, "can be eaten fresh, with shortcakes, made into preserves and jams or used to flavor other preparations" (Harrington 1967:238).

Cholla cactus (*Cylindropuntia imbricata*) has many uses which have been documented ethnographically. Moerman States:

Drug– Dermatological Aid: Ground needle coverings made into a paste and used for boils. Ear Medicine– Dried stem pith used for earache and running ear.
Food– Dried Food : Young joints split lengthwise, dried, and stored for winter use. Unspecified: Joints roasted and eaten. Fruit dried for winter use., Fruit eaten raw or stewed. Dried Food: Fruits pit baked overnight, dried, boiled, salted, and eaten with pinole.
Fiber– Sewing Material: Thorns used as sewing material and for tattooing.
Other– Lighting: Dried woody stems used for candles and torches before the presence of other forms of lighting (Moerman 1999:367).

A puffball (*Lycoperdon perlatum*) was recovered in sample 5LA3333.022.055. Generally speaking, puffballs are edible only in their early stages of development (Katsaros1990:130) and are considered poisonous when they reach maturity.

One charred juniper berry along with four charred juniper seeds were recovered in two of the samples. This might indicate that junipers were being used either as a source of food or medicine. Moerman states "that the fruits were sometimes mixed with chopped meat, put into a clean deer stomach, and roasted." Other ethnographic accounts indicate that the fruit was roasted, water added, and the mixture made into a gravy. The berries can be boiled and eaten. Also, the berries were sometimes used to season meat (Moerman 1999:285). Medicinally, this species was used as an anticonvulsive, a cough medicine, an antiheumatic, a gynecological aid, a laxative and as an Emetic (Moerman 1999:285).

<u>Results:</u>

5LA3333

Three samples were analyzed from 5LA3333. Sample 5LA03333.022.055 contained one unburned puffball (*Lycoperdon perlatum*). Sample 5LA03333.022.056 contained 24 complete Multirib Vallonia (*Vallonia gracilicosta*) gastropods (Figure 1) and five complete White-Lip Dagger (*Pupoides albilabris*) gastropods (Figure 2). Sample 5LA03333.022.066 contained two complete White-Lip Dagger (*Pupoides albilabris*) gastropods and seven complete Multirib Vallonia (*Vallonia gracilicosta*) gastropods (Table 1).

5LA5612

Four gastropod samples were analyzed from 5LA5612. Sample 5LA05612.017.049 contained one complete and one fragmented Rocky Mountain Dagger (*Pupoides inoratus*) gastropod (Figure 3), one complete White-Lip Dagger (*Pupoides albilabris*) gastropod and one fragmented *Oxyloma* sp. gastropod. Sample 5LA05612.017.050 contained nine complete Multirib Vallonia (*Vallonia gracilicosta*) gastropods and one complete Rocky Mountain Dagger (*Pupoides inoratus*) gastropod. Sample 5LA05612.017.053 contained 11 complete Multirib Vallonia (*Vallonia gracilicosta*) gastropods and four complete Rocky Mountain Dagger (*Pupoides inoratus*) gastropods. Sample 5LA05612.017.054 contained 14 complete Multirib Vallonia (*Vallonia gracilicosta*) gastropods and two complete and three fragmented Rocky Mountain Dagger (*Pupoides inoratus*) gastropods along with three *Oxyloma* sp. gastropod fragments (Figure 4), (Table 1).

5LA6108

A total of 14 samples were analyzed from 5LA6108. All seeds listed below are unburned unless otherwise stated. Sample 5LA06108.000.353 contained one complete grape (*Vitis riparia*) seed. Sample 5LA06108.000.367 contained six complete grape seeds (Figure 5), one complete and one fragmented cholla cactus (*Cylindropuntia imbricata*)

seed (Figure 6), three complete juniper (*Juniperus monosperma*) seeds (Figure 7) and eleven raspberry (*Rubus idaeus*)seeds (Figure 8). Sample 5LA06108.000.369 contained 12 fragmented and three complete juniper seeds along with one complete grape seed. Also present were five complete raspberry seeds, three fragmented cholla cactus seeds and three complete strawberry (*Fragaria virginiana*) seeds (Figure 9). Sample 5LA06108.000.372 contained eight complete grape seeds, one charred berry fragment from an unknown species, three complete and two unburned fragmented juniper seeds and eight raspberry seeds. Sample 5LA06108.000.434 contained one complete juniper berry. Sample 5LA06108.000.438 contained four charred and complete along with 18 charred and fragmented juniper seeds. This sample also contained one charred juniper berry fragment. Sample 5LA06108.000.440 contained five unknown seed species from the composite (Asteraceae) family along with three complete raspberry seeds and five complete strawberry seeds.

Sample 5LA06108.000.442 contained one complete raspberry seed and one complete strawberry seed. Sample 5LA06108.000.443 contained 1.43 grams of melted and fused grass phytoliths. Sample 5LA06108.000.444 contained .09 grams of burned egg shell fragments. Sample 5LA06108.000.447 had the seed numbers estimated for the very tiny seeds due to the massive numbers of seeds present in the light fraction. This sample contained thousands of strawberry seeds and hundreds of raspberry seeds. The larger seeds were removed from the sample and counted. Eight grape seeds and one unknown composite seed were recovered. Non-botanical remains included seven unburned rabbit bone fragments. Sample 5LA06108.000.448 contained two strawberry seeds. Sample 5LA06108.000.449 contained one strawberry seed. Non-botanical remains included four fragmented and unburned bone fragments from a rodent sized animal. Finally, sample 5LA06108.000.450 contained two complete strawberry seeds (Table 1).

Table 1: Macrobotanical and Gastropod Identification from 5LA3333, 5LA5612 and 5LA6108.

Sample Number	Common Name	Scientific Name	N = c	f	Comments
5LA03333.022.055	Puffball	*Lycoperdon perlatum*	1		
5LA03333.022.056	Multirib Vallonia	*Vallonia gracilicosta*	24		
	White-Lip Dagger	*Pupoides albilabris*	5		
5LA03333.022.066	Multirib Vallonia	*Vallonia gracilicosta*	7		
	White-Lip Dagger	*Pupoides albilabris*	2		
5LA05612.017.049	White-Lip Dagger	*Pupoides albilabris*	1		
	Rocky Mnt. Dagger	*Pupoides inoratus*	1	1	
	Oxyloma	*Oxyloma* sp.		1	
5LA05612.017.050	Multirib Vallonia	*Vallonia gracilicosta*	9		
	Rocky Mnt. Dagger	*Pupoides inoratus*	1		
5LA05612.017.053	Multirib Vallonia	*Vallonia gracilicosta*	11		
	Rocky Mnt. Dagger	*Pupoides inoratus*	4		
5LA05612.017.054	Multirib Vallonia	*Vallonia gracilicosta*	14		
	Rocky Mnt. Dagger	*Pupoides inoratus*	2	3	
	Oxyloma sp.	*Oxyloma sp.*		3	
5LA06108.000.353	Grape	*Vitis riparia*	1		
5LA06108.000.367	Grape	*Vitis riparia*	6		
	Cholla cactus	*Cylindropuntia imbricata*	1	1	
	Juniper	*Juniperus monosperma*	3		
	Raspberry	*Rubus idaeus*	11		
5LA06108.000.369	Cholla cactus	*Cylindropuntia imbricata*		3	
	Grape	*Vitis riparia*	1		
	Juniper	*Juniperus monosperma*	3	12	
	Raspberry	*Rubus idaeus*	5		
	Strawberry	*Fragaria virginiana*	3		
5LA06108.000.372	Grape	*Vitis riparia*	8		Berry is charred.
	Juniper	*Juniperus monosperma*	3	2	
	Raspberry	*Rubus idaeus*	8		
	Unknown berry sp.	unknown sp.	1		
5LA06108.000.434	Juniper berry	*Juniperus monosperma*	1		
5LA06108.000.438	Juniper seed	*Juniperus monosperma*	4	18	Both berry and seeds are charred.
	Juniper berry	*Juniperus monosperma*		1	

Sample Number	Common Name	Scientific Name	N = c	f	Comments
5LA06108.000.440	Raspberry Strawberry Composite	*Rubus idaeus* *Fragaria virginiana* Asteraceae sp.	3 5 5		
5LA06108.000.442	Raspberry Strawberry	*Rubus idaeus* *Fragaria virginiana*	1 1		
5LA06108.000.443	Melted grass phytoliths				N= 1.43 grams
5LA06108.000.444	Burnt eggshell fragments				N= .09 grams
5LA06108.000.447	Grape Raspberry Strawberry Composite Rabbit bone fragments	*Vitis riparia* *Rubus idaeus* *Fragaria virginiana* Asteraceae sp. Leporidae sp.	8 * * 1	 7	*= numerous seeds observed, not counted.
5LA06108.000.448	Strawberry	*Fragaria virginiana*	2		
5LA06108.000.449	Strawberry Rodent sized bone fragments	*Fragaria virginiana*	1	 4	
5LA06108.000.450	Strawberry	*Fragaria virginiana*	2		

c = complete, f = fragment

Discussion:

Macrofloral identification was conducted on 14 light fraction samples, of which, 11 samples were from an historic component at 5LA6108, two samples were from a prehistoric component at the same site, and, one historic sample from 5LA3333. The seeds recovered from the historic component (i.e., the privy) were mainly composed of strawberries, raspberries and grape seeds. A seed count was not conducted on sample 5LA06108.000.447 because it is believed that recording plant diversity was more important than a seed count.

It is unknown if these berries were consumed fresh or if the berries were made into a jam and consumed over a period of several months. Another possibility is the combination of the above two scenarios. What is interesting is that several of the control samples also contained strawberry, raspberry and grape seeds. This might suggest that the above species may have been grown locally. Sample 5LA06108.000443 contained 1.43 grams of melted phytoliths (melted and fused grass silica) from a wall sample. This might represent a fire at the homestead. It is unknown if it represents a deliberate fire such as burning trash or, if it represents a fire which consumed a building.

Non-botanical remains included .09 grams of burnt eggshell fragments which were also recovered from 5LA06108 along with several unburned rabbit bone fragments. These remains suggests that both eggs and rabbit were also consumed at this historic site.

Prehistoric sample 5LA06108.000.434 contained one unburned juniper seed and is probably not culturally significant due to its lack of charring. Keepax stated "It is often a simple matter to reject all uncharred seeds as modern in origin and to retain only the charred material as genuine" (Keepax 1977:226). Sample 5LA06108.000.438 contained four complete and 18 fragmented juniper seeds along with one fragmented charred juniper berry. Unfortunately, this author does not know if the charcoal recovered from this feature contained juniper as the fuel source. If this feature did contain juniper, then the presence of the charred juniper seeds could be dismissed as intrusive, i.e., accidentally introduced into the hearth with the fuel wood (see Bach 1997). If the fuel source was some species other than juniper, then the presence of the charred seeds could be considered culturally significant (see the above ethnobotanical review for juniper).

Gastropod Ecology.

According to Rocque, Multirib Vallonia (*Vallonia gracilicosta*) has been found, "with others, in aspen groves near Tolland, Colorado. F.C. Baker (1929)... found it along with other land snails, in wooded areas under logs, leaves, branches and every sort of debris. Shimek (1930) stated that it is one of the most common land snails living in the prairie groves and border areas in Iowa" (Rocque 1970:762). The White-Lip Dagger Snail (*Pupoides albilabris*), according to Rocque, "prefers limestone soils, though also found elsewhere. It lives under stones or at the roots of grass, in well-drained but often sunny places; following rains it is sometimes found on trees a few feet from the ground. It occurs in all the states from Arizona and Colorado eastward... Taylor (1960) recorded this species for damp to dry habitats: damp protected places, or relatively dry exposed habitats, more tolerant of drought than others, and requiring little cover" (Rocque 1970:730-731). The ecology of Rocky Mountain Dagger Snail (*Pupoides inoratus*) is listed by Rocque as "protected" and is found in grass, shrubs, or woodlands (Rocque 1966:34). Because all of the *Oxyloma* sp. gastropods were fragmentary, species identification could not be performed, therefore no information on ecology could be obtained.

Summary.

Macrofloral identification was conducted on 14 light fraction samples, of which, 11 samples were from the historic component at 5LA6108, two samples were from a prehistoric component at the same site, and, one historic sample from 5LA3333. Gastropod identification was conducted on four samples from 5LA5612 and two samples from 5LA3333.

Macrofloral results from the historic component at 5LA6108 yielded thousands of unburned strawberry seeds, hundreds of unburned raspberry seeds and 22 complete and unburned grape seeds. Also present were nine complete and unburned juniper seeds along with 14 seed fragments. One unburned and complete and four unburned seed fragments from a cholla cactus were also present. Other macrobotanical remains included 1.43 grams of melted phytoliths (melted and fused grass silica) from a wall sample. Non-botanical remains included .09 grams of burned eggshell fragments. Also recovered in the light fraction were several unburned rabbit bone fragments and several smaller bone fragments representing a rodent sized animal.

Macrofloral results from the prehistoric component at 5LA6108 yielded one charred and one unburned juniper berry along with four charred and complete juniper seeds and 18 charred juniper seed fragments. Macrofloral results from 5LA3333 yielded one modern puffball.

Gastropod identification was conducted on four samples from 5LA5612 which yielded three species that included Multirib Vallonia Snail, Rocky Mountain Dagger Snail and several fragments from *Oxyloma* sp. gastropods. 5LA3333 yielded two species of gastropods which included White-Lip Dagger Snail and Multirib Vallonia Snail. None of the above species are good climatic indicators but rather represent terrestrial gastropods which live in conditions ranging from dry to damp areas and can be found in grasslands, shrublands and woodlands.

Figures 1 through 9 show what each gastropod and seed species looks like. These figures do not show all of the gastropods or seeds recovered from each sample.

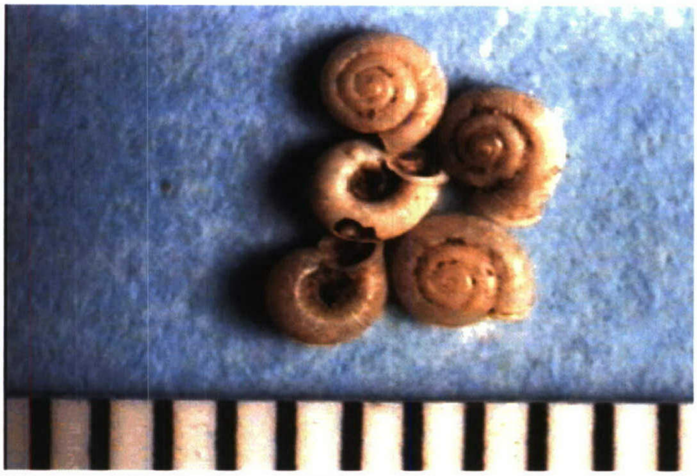


Figure 1. *Vallonia gracilicosta*. Scale=mm

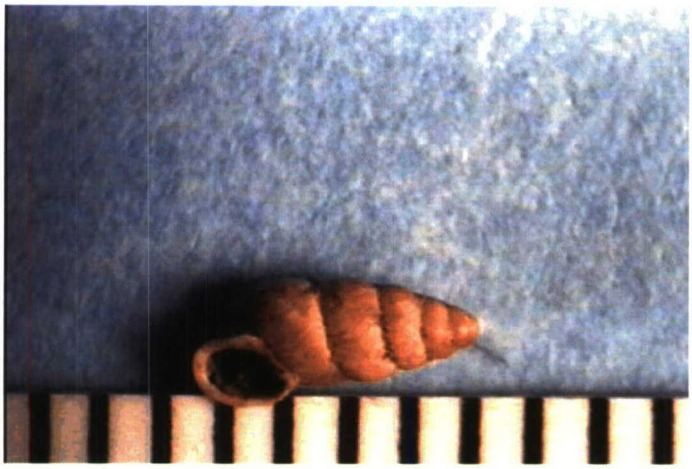


Figure 2. *Pupoides albilabris*. Scale=mm

Figure 3. *Pupoides inoratus*. Scale=mm.

Figure 4. *Oxyloma* sp. Scale=mm.

Figure 5. *Vitis riparia*, grape seeds. Scale=mm.

Figure 6. *Cylindropunta imbricata*, cactus seed. Scale=mm.

Figure 7. *Juniperus monosperma*, Juniper seeds. Scale=mm.

Figure 8. *Rubus ideaus*, Raspberry seeds. Scale=mm.

Figure 9. *Fragaria virginiana*, Strawberry seeds. Scale=mm.

References Cited:

Bach, Daniel R.

1997 Interpreting the Cultural Significance of Charred and Uncharred Seeds Recovered from Prehistoric Hearths and Living Floors: Theory, Method and Implications. M.A. thesis, Department of Anthropology, University of Wyoming, Laramie.

Benson, Lyman

1982 *The Cacti of the United States and Canada.* Stanford University Press, Stanford, California.

Core, H.A., W.A. Cote and A.C. Day

1979 *Wood Structure and Identification. 2nd Ed.* Syracuse University Press. Syracuse, New York.

Davis, Linda W.

1993 *Weed Seeds of the Great Plains: A Handbook for Identification.* University Press of Kansas. Lawrence, Kansas.

Harrington, H.D.

1967 *Edible Native Plants of the Rocky Mountains.* The University of New Mexico Press.

Hoadley, R. Bruce

1990 *Identifying wood: accurate results with simple tools.* Taunton Press, Newtown, Connecticut.

Katsaros, Peter

1990 *Familiar Mushrooms of North America.* The Audubon Society Pocket Guides. A Chanticleer Press Edition. New York.

Keepax, Carole

1977 Contamination of archaeological deposits by seeds of modern origin with particular reference to the use of flotation. *Journal of Archaeological Sciences* 4: 221-229.

Kirkbride, J., Gunn, Charles R., Anna L. Weitzman, and Michael J. Dallwitz

2000 *Legume (Fabaceae) Fruits and Seeds.* Parkway Publisher, Inc. Boone, North Carolina.

Martin, Alexander C. and William D. Barkley

2000 *Seed Identification Manual.* The Blackburn Press. Caldwell, New Jersey.

Moerman, Daniel E.

1999 *Native American Ethnobotany.* Timber Press. Portland, Oregon.

Musil, Albina F.

1921 *Identification of Crop and Weed Seeds, Agricultural Handbook No. 219.* U.S. Government Printing Office. Washington, D.C.

Panshin, A. J. and Carl de Zeeuw

1970 *Textbook of Wood Technology: Vol. 1: structure, identification, uses, and properties of the commercial woods of the United States and Canada, 3rd Ed.*

McGraw-Hill, New York.

Pearsall, Deborah M.
1989 *Paleoethnobotany: A Handbook of Procedures*. Academic Press, San Diego.

Rocque, Aurele La
1966 *Pleistocene Mollusca of Ohio Part 1, Bulletin 62.* State of Ohio, Department of Natural Resources. Division of Geological Survey. Columbus, Ohio
1967 *Pleistocene Mollusca of Ohio Part 2, Bulletin 62.* State of Ohio, Department of Natural Resources. Division of Geological Survey. Columbus, Ohio
1968 *Pleistocene Mollusca of Ohio Part 3, Bulletin 62.* State of Ohio, Department of Natural Resources. Division of Geological Survey. Columbus, Ohio
1970 *Pleistocene Mollusca of Ohio Part 4, Bulletin 62.* State of Ohio, Department of Natural Resources. Division of Geological Survey. Columbus, Ohio

Weber, William A.
1990 *Colorado Flora: Eastern Slope*. University Press of Colorado. Niwot, Colorado.

Young, James A. and Cheryl G. Young
1992 *Seeds of Woody Plants in North America*. Dioscorides Press. Portland, Oregon.

APPENDIX III

RADIOCARBON DATES

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-22.1:lab. mult=1)

Laboratory number: **Beta-192258**

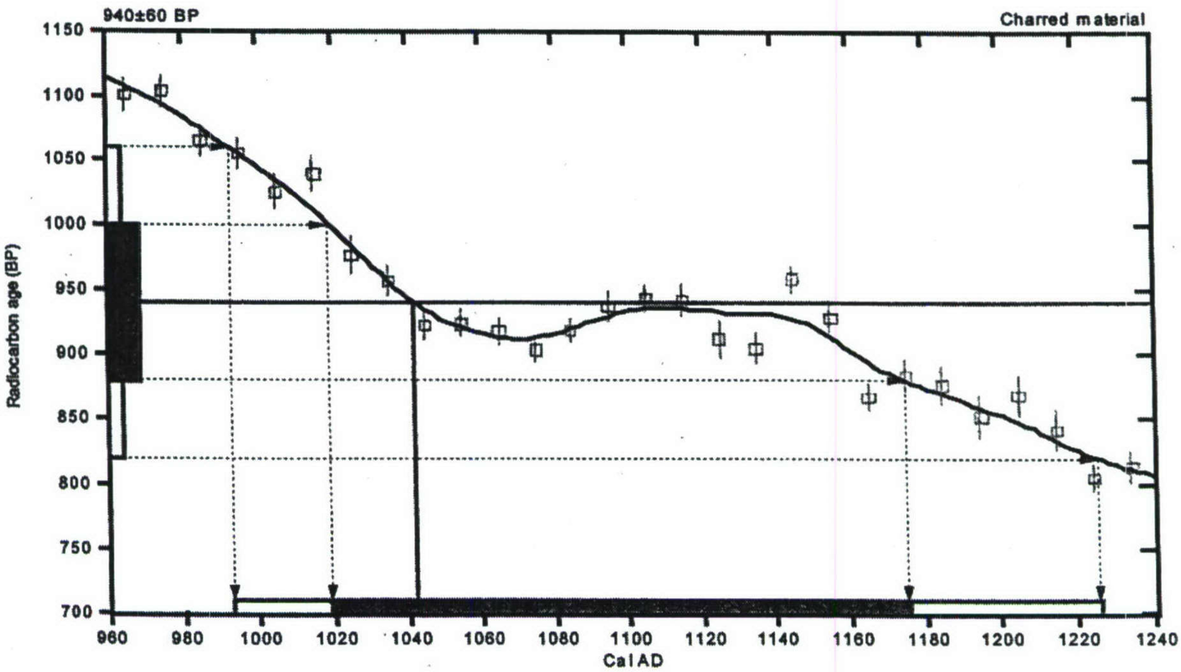
Conventional radiocarbon age: **940±60 BP**

2 Sigma calibrated result: **Cal AD 990 to 1230 (Cal BP 960 to 720)**
(95% probability)

Intercept data

Intercept of radiocarbon age
with calibration curve: Cal AD 1040 (Cal BP 910)

1 Sigma calibrated result: Cal AD 1020 to 1180 (Cal BP 930 to 780)
(68% probability)



References:

Database used
Intcal98

Calibration Database

Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii

INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083

Mathematics

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory

4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-19.2:lab. mult=1)

Laboratory number: **Beta-192259**

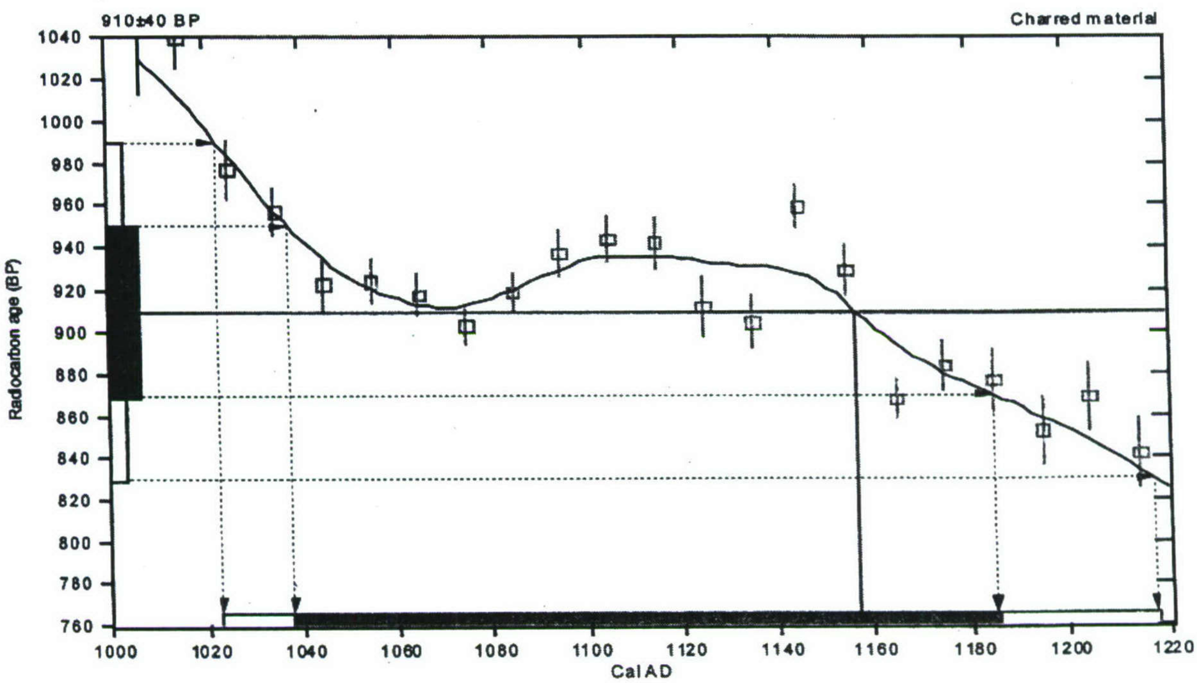
Conventional radiocarbon age: **910±40 BP**

2 Sigma calibrated result: **Cal AD 1020 to 1220 (Cal BP 930 to 730)**
(95% probability)

Intercept data

Intercept of radiocarbon age
with calibration curve: Cal AD 1160 (Cal BP 790)

1 Sigma calibrated result: Cal AD 1040 to 1180 (Cal BP 910 to 760)
(68% probability)



References:

Database used
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory

4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-22.5:lab. mult=1)

Laboratory number: **Beta-192260**

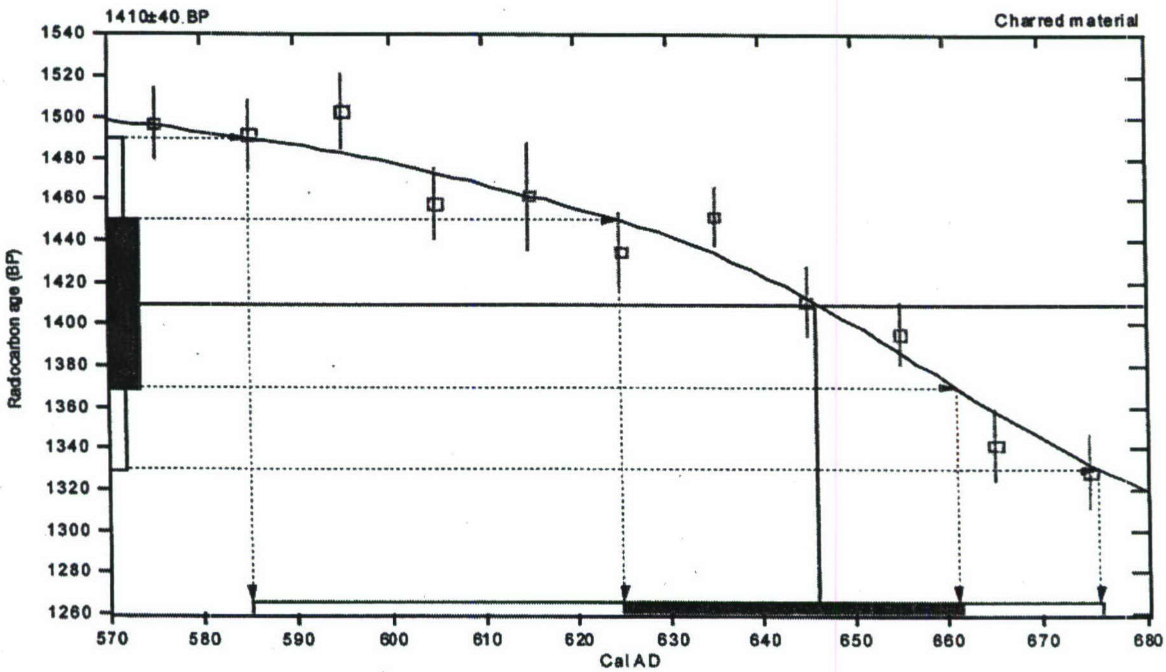
Conventional radiocarbon age: **1410±40 BP**

2 Sigma calibrated result: **Cal AD 580 to 680 (Cal BP 1360 to 1270)**
(95% probability)

Intercept data

Intercept of radiocarbon age
with calibration curve: Cal AD 650 (Cal BP 1300)

1 Sigma calibrated result: Cal AD 620 to 660 (Cal BP 1320 to 1290)
(68% probability)



References:

Database used
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory

4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-21.2:lab. mult=1)

Laboratory number: **Beta-192261**

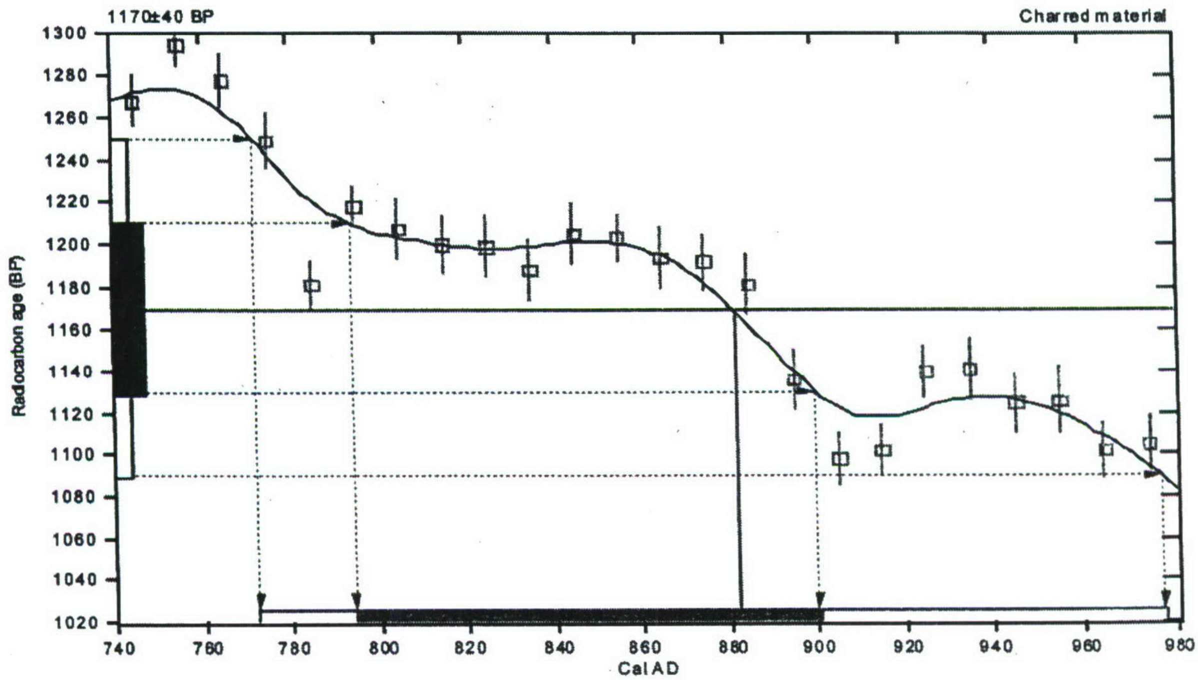
Conventional radiocarbon age: **1170±40 BP**

2 Sigma calibrated result: **Cal AD 770 to 980 (Cal BP 1180 to 970)**
(95% probability)

Intercept data

Intercept of radiocarbon age
with calibration curve: Cal AD 880 (Cal BP 1070)

1 Sigma calibrated result: Cal AD 790 to 900 (Cal BP 1160 to 1050)
(68% probability)



References:

Database used
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory

4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-11:lab. mult=1)

Laboratory number: **Beta-192262**

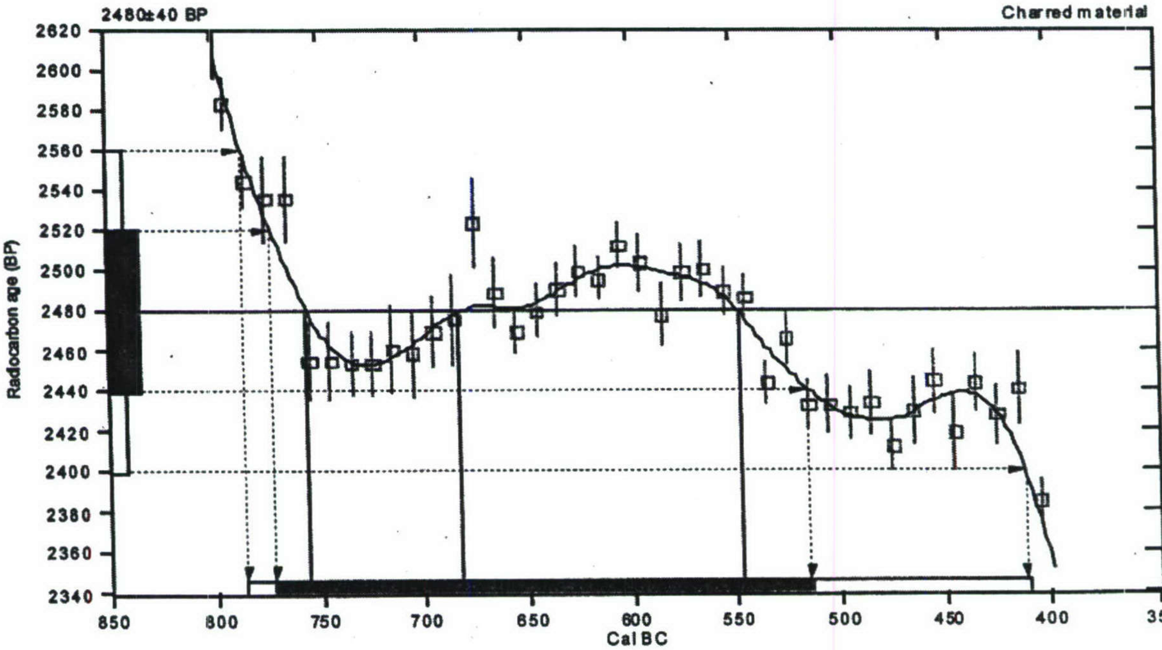
Conventional radiocarbon age: **2480±40 BP**

2 Sigma calibrated result: **Cal BC 790 to 410 (Cal BP 2740 to 2360)**
(95% probability)

Intercept data

Intercepts of radiocarbon age
with calibration curve: Cal BC 760 (Cal BP 2710) and
Cal BC 680 (Cal BP 2630) and
Cal BC 550 (Cal BP 2500)

1 Sigma calibrated result: Cal BC 770 to 520 (Cal BP 2720 to 2460)
(68% probability)



References:

Database used
INTCAL98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, Radiocarbon 40(3), p1041-1083
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory

4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com

APPENDIX IV

SOIL SAMPLE ANALYSIS

Colorado Analytical Laboratories, Inc.

LABORATORY ANALYSIS REPORT

REPORT TO: MONA CHARLES

LAB NO: 19728

DATE RCVD: 5/19/04

REPORTED: 6/4/04

PO: VERBAL

BILL TO: FORT LEWIS COLLEGE
ANTHROPOLOGY DEPT
1000 RIM DRIVE
DURANGO, CO 81301

PROJECT: PINON CANYON MANEUVER SITE

PARAMETER	METHOD REFERENCE	MIN. REPORTING LIMIT	UNITS
CALCIUM CARBONATE EQUIV.	USDA60 6(23c)	0.1	% CaCO3 EQUIV.
HYDROMETER	ASA1 43-5	1	%
pH	ASA2 12-2.6.5	0.1	UNITS
ORGANIC MATTER	ASA2 29-3.5.2	0.1	%

METHOD REFERENCE

USDA60 = "DIAGNOSIS & IMPROVEMENT OF SALINE & ALKALI SOILS"; USDA HANDBOOK 60 U.S. SALINITY LABORATORY STAFF; 2ND EDITION, 1969; LA RICHARDS

ASA1 = "METHODS OF SOIL ANALYSIS, PART 1"; ASA No. 9 AMERICAN SOCIETY of AGRONOMY; 2nd EDITION, 1986; A. KLUTE

ASA2 = "METHODS OF SOIL ANALYSIS, PART 2"; ASA No. 9 AMERICAN SOCIETY of AGRONOMY; 2nd EDITION, 1982; A. L. PAGE

ANALYSIS SUPERVISED BY

DATA APPROVED FOR RELEASE BY

240 South Main Street / Brighton, Colorado 80601-0507 / 303-659-2313
Mailing Address: P.O. Box 507 / Brighton, Colorado 80601-0507 / Fax: 303-659-2315

Colorado Analytical Laboratories, Inc.

MONA CHARLES
FORT LEWIS COLLEGE
PINON CANYON MANEUVER SITE
06/04/04

SAMPLE ID:	HYDROMETER RESULTS SAND (%)	SILT (%)	CLAY (%)	USDA TEXTURE
FS15 UNIT5 LAYER3 LEVEL3	38	52	10	SILT LOAM
FS48 UNIT6 WEST WALL STRAT I	51	35	14	LOAM
FS48 UNIT6 WEST WALL STRAT II	54	32	14	SANDY LOAM
FS48 UNIT6 WEST WALL STRAT III	28	41	31	CLAY LOAM
FS53 UNIT 5 SOUTH WALL STRATA I	18	29	53	CLAY
FS53 UNIT 5 SOUTH WALL STRATA II	46	40	14	LOAM
FS53 UNIT 5 SOUTH WALL STRATA III	32	56	12	SILT LOAM
FS53 UNIT 5 SOUTH WALL STRATA IV	50	32	18	LOAM
FS53 UNIT 5 SOUTH WALL STRATA V	36	40	24	LOAM
FS32 UNIT 1 N/S WALL STRATA I	58	30	12	SANDY LOAM
FS32 UNIT 1 N/S WALL STRATA II	52	30	18	LOAM
FS32 UNIT 1 N/S WALL STRATA III	43	30	27	LOAM
FS32 UNIT 1 N/S WALL STRATA IV	26	37	37	CLAY LOAM
FS87 UNIT 15 WEST WALL STRATA I	43	30	27	LOAM
FS90 UNIT 15 EAST WALL STRATA IA	40	31	29	CLAY LOAM
FS87 UNIT 15 WEST WALL STRATA II	47	35	18	LOAM
FS87 UNIT 15 WEST WALL STRATA III	45	39	16	LOAM
FS100 UNIT 18 SOUTH WALL STRATA I	45	41	14	LOAM
FS100 UNIT 18 SOUTH WALL STRATA II	22	39	39	CLAY LOAM
FS100 UNIT 18 SOUTH WALL STRATA III	46	34	20	LOAM
FS110 UNIT 17 SOUTH WALL STRATA I	28	35	37	CLAY LOAM
FS110 UNIT 17 SOUTH WALL STRATA II	26	39	35	CLAY LOAM
FS110 UNIT 17 SOUTH WALL STRATA III	26	41	33	CLAY LOAM
FS110 UNIT 17 SOUTH WALL STRATA IV	22	39	39	CLAY LOAM
FS129 UNIT 21 EAST WALL STRATA I	42	36	22	LOAM
FS129 UNIT 21 EAST WALL STRATA II	46	36	18	LOAM
FS59 UNIT 10 NORTH WALL STRATA I	53	33	14	SANDY LOAM
FS59 UNIT 10 WEST WALL STRATA II	49	41	10	LOAM
FS131 UNIT 22 SOUTH WALL STRATA I	18	49	33	SILT CLAY LOAM
FS131 UNIT 22 SOUTH WALL STRATA II	13	42	45	SILT CLAY
FS131 UNIT 22 SOUTH WALL STRATA III	13	56	31	SILT CLAY LOAM
FS131 UNIT 22 SOUTH WALL STRATA IV	31	34	35	CLAY LOAM
FS79 UNIT 4 EAST WALL STRATA I	31	32	37	CLAY LOAM
FS79 UNIT 4 EAST WALL STRATA II	17	30	53	CLAY
FS79 UNIT 4 EAST WALL STRATA III	17	28	55	CLAY
FS79 UNIT 4 EAST WALL STRATA IV	13	30	57	CLAY

240 South Main Street / Brighton, Colorado 80601-0507 / 303-659-2313
Mailing Address: P.O. Box 507 / Brighton, Colorado 80601-0507 / Fax: 303-659-2315

Colorado Analytical Laboratories, Inc.

MONA CHARLES
FORT LEWIS COLLEGE
PINON CANYON MANEUVER SITE
06/04/04

SAMPLE ID:	ORGANIC MATTER (%)	pH (UNITS)	LIME (% CaCO3 EQUIV.)
FS32 UNIT 1 N/S WALL STRATA I	-	7.7	2.3
FS32 UNIT 1 N/S WALL STRATA II	-	7.9	4.9
FS32 UNIT 1 N/S WALL STRATA III	-	7.8	6.7
FS32 UNIT 1 N/S WALL STRATA IV	-	7.8	12.0
FS100 UNIT 18 SOUTH WALL STRATA I	12.5	7.8	-
FS100 UNIT 18 SOUTH WALL STRATA II	2.5	7.9	-
FS100 UNIT 18 SOUTH WALL STRATA III	2.5	7.7	-
FS129 UNIT 21 EAST WALL STRATA I	3.5	7.8	4.8
FS129 UNIT 21 EAST WALL STRATA II	5.5	7.5	2.4
FS59 UNIT 10 NORTH WALL STRATA I	2.6	8.0	9.6
FS59 UNIT 10 WEST WALL STRATA II	6.0	7.5	8.9
FS79 UNIT 4 EAST WALL STRATA I	2.3	7.9	4.4
FS79 UNIT 4 EAST WALL STRATA II	1.8	8.0	6.1
FS79 UNIT 4 EAST WALL STRATA III	1.7	7.9	7.1
FS79 UNIT 4 EAST WALL STRATA IV	1.6	7.8	8.8

240 South Main Street / Brighton, Colorado 80601-0507 / 303-659-2313
Mailing Address: P.O. Box 507 / Brighton, Colorado 80601-0507 / Fax: 303-659-2315

APPENDIX V

SHOVEL TEST RESULTS

Shovel Test Results, Site 5LA3333

Shovel Test	Depth of Stratum	Stratigraphic Description	Materials Recovered
1	0-5	10YR 5/3, loamy sand, 15% gravel, single-grained, violent CaCO3	None
1	23-72	10YR 6/3, clay loam, 10% gravel, well developed, violent CaCO3	None
1	5-33	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, no reaction to CaCO3	None
1	54	Rock in >50% of pit	None
2	0-5	10YR 5/3, loamy sand, 15% gravel, singles-grained, violent CaCO3	None
2	20-45	10YR 6/3, clay loam, 10% gravel, well developed, violent CaCO3	None
2	2-24	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, no reaction to CaCO3	None
2	43-70	10YR 6/3, clay loam, 10% gravel, well developed, violent CaCO3	None
3	0-5	10YR 5/3, loamy sand, 15% gravel, single-grained, violent CaCO3	None
3	2-25	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, no reaction to CaCO3, heavy	1 metal washer (5-20 cm), 2 lithic flakes (20-30 cm)
3	25-72	10YR 6/3, clay loam, 10% gravel, well developed, violent CaCO3	See STP 3, Stratum 2
4	0-8	10YR 5/3, loamy sand, 15% gravel, single-grained, violent CaCO3	None
4	35-72	10YR 5/3, clay loam, 10% gravel, well developed, violent CaCO3	None
4	5-35	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, slight reaction to CaCO3, heavy bioturbation	None
5	0-8	10YR 5/3, loamy sand, 15% gravel, single-grained, violent CaCO3	None

Shovel Test Results, Site 5LA3333, PCMS

Shovel Test	Depth of Stratum	Stratigraphic Description	Materials Recovered
5	14-47	10YR 6/3, clay loam, 10% gravel, well developed, violent CaCO3	None
5	29-47	Sandstone rocks	None
5	3-14	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, moderate CaCO3	None
6	0-6	10YR 5/3, loamy sand, 15% gravel, single-grained, violent CaCO3	None
6	13-50	10YR 6/3, clay loam, 10% gravel, well developed, violent CaCO3	None
6	50-70	10YR 6/3, clay loam to sandy clay, 10% gravel, well developed, violent CaCO3	None
6	6-13	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, no reaction to CaCO3	None
7	0-4	10YR 5/3, loamy sand, 15% gravel, single-grained, slight CaCO3	None
7	4-7	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, no reaction to CaCO3	None
7	7-70	10YR 6/3, clay loam, 10% gravel, well developed, violent CaCO3	None
8	0-3	10YR 5/3, loamy sand, 15% gravel, single-grained, moderate to violent CaCO3	None
8	3-6	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, moderate to violent CaCO3	None
8	38-72	10YR 6/3, clay loam to sandy clay, 10% gravel, well developed, violent CaCO3	None
8	6-38	10YR 6/3, clay loam, 10% gravel, well developed violent CaCO3	None
9	0-4	10YR 5/3, loamy sand, 15% gravel, single-grained, slight CaCO3	None
9	14-52	10YR 6/3, clay loam, 10% gravel, well developed, moderate CaCO3	None
9	4-14	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, moderate CaCO3	None

Shovel Test Results, Site 5LA3333, PCMS

Shovel Test	Depth of Stratum	Stratigraphic Description	Materials Recovered
9	52-70	10YR 6/3, clay loam to sandy clay, 10% gravel, well developed, violent CaCO3	None
10	0-4	10YR 5/3, loamy sand, 15% gravel, single-grained, none to slight CaCO3	None
10	27-42	10YR 6/3, clay loam, 10% gravel, well developed, moderate CaCO3	None
10	4-27	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, no reaction to CaCO3	None
10	42-70	10YR 6/3, clay loam to sandy clay, 10% gravel, well developed, violent CaCO3	None
11	0-7	10YR 5/3, loamy sand, 15% gravel, single-grained, slight CaCO3	None
11	19-48	10YR 6/3, clay loam, 10% gravel, well developed, violent CaCO3	None
11	48-70	10YR 6/3, clay loam to sandy clay, 10% gravel, well developed, violent CaCO3	None
11	7-19	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, moderate CaCO3	None
12	0-4	10YR 5/3, loamy sand, 15% gravel, single-grained, moderate CaCO3	None
12	43	Rock in >50% of pit	None
12	4-8	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, moderate CaCO3	None
12	8-43	10YR 6/3, clay loam, 10% gravel, well developed, violent CaCO3	None
13	0-4	10YR 5/3, loamy sand, 15% gravel, single-grained, violent CaCO3	None
13	14-40	10YR 6/3, clay loam, 10% gravel, well developed, violent CaCO3	1 nail (20-40 cm)
13	40	Rock in >50% of pit	None
13	4-14	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, moderate CaCO3	None

Shovel Test Results, Site 5LA3333, PCMS

Shovel Test	Depth of Stratum	Stratigraphic Description	Materials Recovered
14	0-7	10YR 5/3, loamy sand, 15% gravel, single-grained, violent CaCO3	3 miscellaneous metal (0-5 cm)
14	20-54	10YR 6/3, clay loam, 10% gravel, well developed, violent CaCO3	1 miscellaneous metal (probably from surface or bioturbation)
14	7-20	10YR 5/3, sandy loam, 25% gravel, weak to moderate development, no reaction to CaCO3	1 metal wire, 1 scrap metal (5-10 cm)
15	0-4	10YR 5/3, loamy sand, 15% gravel, single-grained, violent CaCO3	None
15	18-48	10YR 6/3, clay loam, 10% gravel, well developed, violent CaCO3	None
15	4-18	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, no reaction to CaCO3	None
15	48	Bedrock encountered	None
16	0-7	10YR 5/3, loamy sand, 15% gravel, single-grained, moderate CaCO3	None
16	18-40	10YR 6/3, clay loam, 20% gravel, well developed, violent CaCO3	None
16	40-70	10YR 6/3, clay loam, 25% gravel, well developed, violent CaCO3	None
16	7-18	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, moderate CaCO3	None
17	0-5	10YR 5/3, loamy sand, 15% gravel, single-grained, violent CaCO3	None
17	14-60	10YR 6/3, clay loam, 45% gravel and boulder sized rocks, well developed, violent CaCO3	None
17	5-14	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, no reaction to CaCO3	None
17	60	Rock covering entire pit	None
18	0-5	10YR 5/3, loamy sand, 15% gravel, single-grained, violent CaCO3	2 glass fragments (0-6 cm)
18	22-70	10YR 6/3, clay loam, 10% gravel, well developed, violent CaCO3, large area of bioturbation	2 lithic flakes (20-40 cm)

Shovel Test Results, Site 5LA3333, PCMS

Shovel Test	Depth of Stratum	Stratigraphic Description	Materials Recovered
18	5-22	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, no reaction to CaCO3,	1 bone (6-20 cm)
19	0-5	10YR 5/3, loamy sand, 15% gravel, single-grained, violent CaCO3	None
19	18-52	10YR 6/3, clay loam, 10% gravel, well developed, violent CaCO3	None
19	5-18	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, no reaction to CaCO3	1 glass fragment (9-20 cm)
19	52	Large tabular rock nearing covering bottom of pit	None
20	0-10	10YR 5/3, loamy sand, 15% gravel, single-grained, violent CaCO3	1 nail (0-9 cm), 1 glass fragment (0-9 cm)
20	10-45	10YR 5/3, sandy loam, 10% gravel, weak to moderate development, no reaction to CaCO3	None
20	45-68	10YR 6/3, clay loam, well developed structure with pebble to boulder-sized rocks, violent CaCO3, large area of bioturbation	None
21	0-10	10YR 5/3, loamy sand, single-grained with 15% gravel, some cobble-sized rocks, violent CaCO3	4 glass fragments (0-10 cm)
21	10-25	10YR 5/3, sandy loam, 10% gravel, 20% cobbles, weak to moderate development, no reaction to	1 glass fragment (10-20 cm), 1 nail (10-20 cm)
21	25-43	10YR 6/3, clay loam, well developed, 10% gravel, pebble to cobble-sized rocks, violent CaCO3, large amounts of bioturbation	None
21	43	Rock covering bottom of pit	None

Shovel Test Results, Site 5LA4417, PCMS

Shovel Test	Depth of Stratum	Stratigraphic Description	Materials Recovered
1	0-6	10YR 5/4, loamy sand, single-grained, 0-10% gravel, no reaction to CaCO3	None
1	34-40	10YR 4/4, clay loam, well-developed, angular blocky, 40-50% gravels, violent CaCO3	None
1	40	Bedrock encountered	None
1	6-34	2.5YR 6/2, sandy clay loam, weak angular blocky, 10% gravel, moderate CaCO3	None
2	0-10	10YR 5/4, loamy sand, single-grained, 0-10% gravel, no reaction to CaCO3	None
2	10-33	2.5YR 6/2, sandy clay loam, weak angular blocky, 10% gravel, moderate CaCO3	None
2	33-44	10YR 4/4, clay loam, well-developed, angular blocky, 40-50% gravels, violent CaCO3	None
2	44	Bedrock encountered	None
3	0-5	10YR 5/4, loamy sand, single-grained, 0-10% gravel, no reaction to CaCO3	None
3	33-72	10YR 4/4, clay loam, well-developed, angular blocky, 0% gravels, violent CaCO3	None
3	5-33	2.5YR 6/2, sandy clay loam, weak angular blocky, 10% gravel, moderate CaCO3	None
4	0-10	10YR 5/4, loamy sand, single-grained, 0-10% gravel, no reaction to CaCO3	None
4	10-50	2.5YR 6/2, sandy clay loam, weak angular blocky, 10% gravel, moderate CaCO3	None
4	50-71	10YR 4/4, clay loam, well-developed, angular blocky, 40-50% gravels, violent CaCO3	None
5	0-7	10YR 5/4, loamy sand, single-grained, 0-10% gravel, no reaction to CaCO3	None
5	54-58	10YR 4/4, clay loam, well-developed, angular blocky, 40-50% gravels, violent CaCO3	None

Shovel Test Results, Site 5LA4417, PCMS

Shovel Test	Depth of Stratum	Stratigraphic Description	Materials Recovered
5	58	Bedrock encountered	None
5	7-54	2.5YR 6/2, sandy clay loam, weak angular blocky, 10% gravel, moderate CaCO3	None
6	0-6	10YR 5/4, loamy sand, single-grained, 0-10% gravel, no reaction to CaCO3	None
6	50	Bedrock encountered	None
6	6-50	2.5YR 6/2, sandy clay loam, weak angular blocky, 65% gravel, moderate CaCO3	None
7	0-8	10YR 5/4, loamy sand, single-grained, 0-10% gravel, no reaction to CaCO3	None
7	32	Bedrock encountered	None
7	8-32	2.5YR 6/2, sandy clay loam, weak angular blocky, 10% gravel, no reaction to CaCO3	None
8	0-8	10YR 5/4, loamy sand, single-grained, 0-10% gravel, viiolent CaCO3	None
8	30-40	10YR 4/4, clay loam, well-developed, angular blocky, 40-50% gravels, violent CaCO3	None
8	40	Bedrock encountered	None
8	8-30	2.5YR 6/2, sandy clay loam, weak angular blocky, 10% gravel, violent CaCO3	None
9	0-8	10YR 5/4, loamy sand, single-grained, 0-10% gravel, no reaction to CaCO3	None
9	24-30	10YR 4/4, clay loam, well-developed, angular blocky, 40-50% gravels, violent CaCO3	None
9	30	Bedrock encountered	None
9	8-30	2.5YR 6/2, sandy clay loam, weak angular blocky, 10% gravel, moderate CaCO3	None
10	0-8	10YR 5/3, sandy loam, 10% gravel, single-grained, weak development, violent CaCO3	None
10	26-50	10YR 7/2, sandy loam, 30% gravel, blocky, violent CaCO3	None

Shovel Test Results, Site 5LA4417, PCMS

Shovel Test	Depth of Stratum	Stratigraphic Description	Materials Recovered
10	8-26	10YR 6/4, sandy loam, 10% gravel, weak angular blocky, violent CaCO3	None
11	32-65	10YR 7/2, sandy loam, 30% gravel, blocky, violent CaCO3	None
11	4-32	10YR 6/4, sandy loam, 10% gravel, weak angular blocky, violent CaCO3	None
12	0-4	10YR 5/3, sandy loam, 10% gravel, single-grained, weak development, violent CaCO3	None
12	0-8	10YR 5/3, sandy loam, 10% gravel, single-grained, weak development, violent CaCO3	None
12	8-70	10YR 7/2, sandy loam, 50% gravel, blocky, violent CaCO3	None
13	0-10	10YR 5/3, sandy loam, 10% gravel, single-grained, weak development, violent CaCO3	None
13	10-34	10YR 6/4, sandy loam, 10% gravel, weak angular blocky, violent CaCO3	None
13	34-70	10YR 7/2, sandy loam, 30% gravel, blocky, violent CaCO3	None
14	0-9	10YR 5/3, sandy loam, 10% gravel, single-grained, weak development, violent CaCO3	None
14	26-70	10YR 7/2, sandy loam, 30% gravel, blocky, violent CaCO3 INCREASE ROCKS???????	
14	9-26	10YR 6/4, sandy loam, 10% gravel, weak angular blocky, violent CaCO3	None

Shovel Test Results, Site 5LA5612, PCMS

Shovel Test	Depth of Stratum	Stratigraphic Description	Materials Recovered
1	0-4	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, slight reaction to $CaCO_3$.	None
1	4-44	10YR 6/3, sandy clay, 1-15%, gravel, weak development	None
1	44-66	10YR 4/3, sandy clay loam, 1-5% gravel, weak development, violent $CaCO_3$	None
2	0-7	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, moderate CACO3	None
2	30-73	10YR 4/3, sandy clay loam, 1-5% gravel, weak development, violent CACO3	None
2	7-30	10YR 6/3, sandy clay, 1-15% gravel, weak development	None
3	0-7	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, slight CACO3	None
3	7-71	10YR4/3, sandy clay loam, 1-5% gravel, weak development, moderate CACO3 (45-55 cm--pebbles 30-40%, violent $CaCO_3$)	None
4	0-5	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, slight $CaCO_3$	None
4	44-68	10YR 4/3, sandy clay loam, more developed structure, 0-1% gravel, moderate $CaCO_3$	None
4	5-44	10YR 4/3, sandy clay loam, 1-5% gravel, weak development, none to slight $CaCO_3$	None
5	0-4	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, slight $CaCO_3$	None
5	4-47	10YR 4/3, sandy clay loam, 1-5% gravel, weak development, none to slight reaction to $CaCO_3$	None
6	0-6	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, slight $CaCO_3$	None

Shovel Test Results, Site 5LA5612, PCMS

Shovel Test	Depth of Stratum	Stratigraphic Description	Materials Recovered
6	50-70	10YR 4/3, sandy clay loam, 0-1% gravel, more developed structure, slight CACO3	None
6	6-50	10YR 3/3, sandy clay loam 1-5% gravel, weak development, none to slight CACO3	None
7	0-6	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, slight CaCO3	None
7	40-70	10YR 5/4, sandy loam with roots, 0-1% gravel, more developed structure, slight CaCO3	None
7	6-40	10YR 3/3, sandy clay loam, 1-5% gravel, weak development, none to slight CaCO3	None
8	0-8	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, slight CaCO3	None
8	40-70	10YR 4/3, sandy clay loam, 0-1% gravel, more developed structure, slight CACO3	None
8	8-40	10YR 3/3, sandy clay loam 1-5% gravel, weak development, large bioturbation hole, no reaction to CACO3	None
9	0-4	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, slight CaCO3	None
9	4-56	10YR 3/3, sandy clay loam 1-5% gravel, weak development, none to slight CACO3	None
9	56-70	10YR 4/3, sandy clay loam, 0-1% gravel, more developed structure, slight CACO3	None
10	0-6	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, slight CaCO3	None
10	56-70	10YR 4/3, sandy clay loam, 0-1% gravel, more developed structure, slight CACO3	None
10	6-56	10YR 3/3, sandy clay loam 1-5% gravel, weak development, none to slight CACO3	None
11	0-7	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, slight CaCO3	None
11	50-70	10YR 4/3, sandy clay loam, 0-1% gravel, more developed structure, slight CACO3	None

Shovel Test Results, Site 5LA5612, PCMS

Shovel Test	Depth of Stratum	Stratigraphic Description	Materials Recovered
11	7-50	10YR 3/3, sandy clay loam 1-5% gravel, weak development, none to slight CACO3	None
12	0-9	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, slight CaCO3	None
12	45-71	10YR 4/3, sandy clay loam, 0-1% gravel, more developed structure, slight CACO3	None
12	9-45	10YR 3/3, sandy clay loam 1-5% gravel, weak development, none to slight CACO3	None
13	0-12	10YR 5/4, sandy loam with roots, 0-1%gravel, single-grained, slight CaCO3	None
13	12-66	10YR 3/3, sandy clay loam 1-5% gravel, weak development, none to slight CACO3, large area of bioturbation across entire pit	None
13	66-70	10YR 4/3, sandy clay loam, 0-1% gravel, more developed structure, slight CACO3	None
14	0-7	10YR 5/4, sandy loam with roots, 0-1%gravels, single-grained, slight CaCO3	None
14	40	large rock encountered at 40 cm	None
14	7-40	10YR 3/3, sandy clay loam 1-5% gravel, weak development, none to slight CACO3, bioturbation throughout stratum	None
15	0-4	10YR 5/3, sandy loam, single-grained, 0-5% gravel, violent CaCO3	None
15	4-46	10YR 5/3, sandy clay loam, 5-15% gravel, blocky, moderate development, violent CaCO3	None
15	46-70	10YR 5/4, sandy clay loam, 5-15% gravel, blocky, weak development, violent CaCO3	None
16	0-8	10YR 5/3, sandy loam, single-grained, 0-5% gravel, violent CaCO3	None
16	50-70	10YR 5/4, sandy clay loam, 5-15% gravel, blocky, weak development, violent CaCO3	None
16	8-50	10YR 5/3, sandy clay loam, 5-15% gravel, blocky, moderate development, violent CaCO3	None

Shovel Test Results, Site 5LA5612, PCMS

Shovel Test	Depth of Stratum	Stratigraphic Description	Materials Recovered
17	0-6	10YR 5/3, sandy loam, single-grained, 0-5% gravel, violent CaCO3	None
17	62-72	10YR 5/4, sandy clay loam, 5-15% gravel, blocky, weak development, violent CaCO3	None
17	6-62	10YR 5/3, sandy clay loam, 5-15% gravel, blocky, moderate development, violent CaCO3	None
18	0-6	10YR 5/3, sandy loam, single-grained, 0-5% gravel, violent CaCO3	1 lithic flake (0-20 cm)
18	42-75	10YR 5/4, sandy clay loam, 5-15% gravel, blocky, weak development, violent CaCO3, bioturbation throughtout stratum	None
18	6-42	10YR 5/3, sandy clay loam, 5-15% gravel, blocky, moderate development, violent CaCO3	See SPT 18, Stratum 1
19	0-6	10YR 5/3, sandy loam, single-grained, 0-5% gravel, violent CaCO3	2 lithic flakes (0-10 cm)
19	24-74	10YR 5/4, sandy clay loam, 5-15% gravel, blocky, weak development, violent CaCO3	None
19	6-24	10YR 5/3, sandy clay loam, 5-15% gravel, blocky, moderate development, violent CaCO3	See STP 19, Stratum 1
20	0-11	10YR 5/3, sandy loam, single-grained, 0-5% gravel, violent CaCO3	None
20	11-47	10YR 5/3, sandy clay loam, 5-15% gravel, blocky, moderate development, violent CaCO3	None
20	47-71	10YR 5/4, sandy clay loam, 5-15% gravel, blocky, weak development, violent CaCO3	None
21	0-3	10YR 5/3, sandy loam, single-grained, 0-5% gravel, violent CaCO3	None
21	29-72	10YR 5/3, sandy clay loam, 5-15% gravel, blocky, moderate development, violent CaCO3	None
21	3-29	10YR 5/3, sandy clay loam, 5-15% gravel, blocky, moderate development, violent CaCO3	None
22	0-5	10YR 5/3, sandy loam, single-grained, 0-5% gravel, violent CaCO3	1 lithic flake (0-10 cm)

Shovel Test Results, Site 5LA5612, PCMS

Shovel Test	Depth of Stratum	Stratigraphic Description	Materials Recovered
22	23-70	10YR 5/4, sandy clay loam, 5-15% gravel, blocky, weak development, violent CaCO3	None
22	5-23	10YR 5/3, sandy clay loam, 5-15% gravel, blocky, moderate development, violent CaCO3	See STP 22, Stratum 1
23	0-5	10YR 5/3, sandy loam, single-grained, 0-5% gravel, violent CaCO3	None
23	25-70	10YR 5/4, sandy clay loam, 5-15% gravel, blocky, weak development, violent CaCO3	None
23	5-25	10YR 5/3, sandy clay loam, 5-15% gravel, blocky, moderate development, violent CaCO3	None
24	0-6	10YR 5/3, sandy loam with roots, 0-1% gravel, single-grained, no reaction to CaCO3.	None
24	30-69	10YR 5/3, sandy clay loam, more developed structure, 0-1% gravel, moderate CaCO3	1 lithic flake (40-50 cm)
24	6-30	10YR 5/3, sandy clay loam, 1-5% gravel, weak development, none to slight CaCO3	None
25	0-6	10YR 5/3, sandy loam with roots, 0-1% gravel, single-grained, moderate reaction to CaCO3.	None
25	42-70	10YR 4/3, sandy clay loam, more developed structure, 0-1% gravel, moderate CaCO3	None
25	6-42	10YR 6/3, sandy clay, 1-15%, gravel, weak development, moderate CaCO3	None
26	0-7	10YR 5/3, sandy loam, single-grained, 0-5% gravel, violent CaCO3	None
26	25-68	10YR 5/4, sandy clay loam, 30-40% gravel, blocky, weak development, violent CaCO3	1 bulk bone (40-50 cm), 1 lithic flake (40-50 cm)
26	7-25	10YR 5/3, sandy clay loam, 5-15% gravel, blocky, moderate development, violent CaCO3	None
27	0-6	10YR 5/3, sandy loam with roots, 0-1% gravel, single-grained, moderate CaCO3.	None
27	40-70	10YR 5/3, sandy clay loam, more developed structure, 0-1% gravel, violent CaCO3	None

Shovel Test Results, Site 5LA5612, PCMS

Shovel Test	Depth of Stratum	Stratigraphic Description	Materials Recovered
27	6-40	10YR 5/3, sandy clay loam, 1-5% gravel, weak development, moderate CaCO3	None
28	0-10	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, violent CaCO3	None
28	10-36	10YR 3/3, sandy clay loam, 1-5% gravel, weak development, violent CaCO3	None
28	36-70	10YR 5/4, sandy loam with roots, 0-1% gravel, more developed structure, violent CaCO3	None
29	0-8	10YR 5/4, sandy loam with roots, 0-1% gravel, more developed structure, slight CaCO3	None
29	16-70	10YR 5/4, sandy loam with roots, 0-1% gravel, more developed structure, slight CaCO3	6 lithic flakes (40-50 cm), 5 bulk bone (50-60 cm)
29	8-16	10YR 3/3, sandy clay loam, 1-5% gravel, weak development, none to slight CaCO3	None
30	0-5	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, slight CaCO3	None
30	25-67	10YR 5/4, sandy loam with roots, 0-1% gravel, more developed structure, slight CaCO3	None
30	5-25	10YR 3/3, sandy clay loam, 1-5% gravel, weak development, none to slight CaCO3	None
31	0-6	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, slight CaCO3	None
31	45-70	10YR 5/4, sandy loam with roots, 0-1% gravel, more developed structure, slight CaCO3	None
31	6-45	10YR 3/3, sandy clay loam, 1-5% gravel, weak development, none to slight CaCO3	None
32	0-7	10YR 5/3, sandy loam, single-grained, 0-5% gravel, violent CaCO3	1 lithic flake (0-10 cm)
32	20-70	10YR 5/4, sandy clay loam, 5-15% gravel, blocky, weak development, violent CaCO3	None
32	7-20	10YR 5/3, sandy clay loam, 5-15% gravel, blocky, moderate development, violent CaCO3	See STP 32, Stratum 1

Shovel Test Results, Site 5LA5612, PCMS

Shovel Test	Depth of Stratum	Stratigraphic Description	Materials Recovered
33	0-7	10YR 6/3, loamy sand, 10% gravel, single-grained, moderate CaCO3	charcoal (0-10 cm)
33	28	Bedrock encountered	None
33	7-28	10YR 5/4, loamy sand, 10% gravel, single grained, moderate to violent CaCO3	See STP 33, Stratum 1, 1 lithic flake (10-20 cm)
34	0-14	10YR 6/3, loamy sand, 10% gravel, single-grained, moderate CaCO3	None
34	14-46	10YR 5/4, loamy sand, 10% gravel, single grained, moderate to violent CaCO3	None
34	46	Bedrock encountered	None
35	0-15	10YR 6/3, loamy sand, 10% gravel, single-grained, moderate CaCO3	None
35	15-40	10YR 5/4, loamy sand, 10% gravel, single grained, moderate to violent CaCO3	None
35	40	Bedrock encountered	None
36	0-8	10YR 6/3, loamy sand, 10% gravel, single-grained, moderate CaCO3	None
36	16	Bedrock encountered	None
36	8-16	10YR 5/4, loamy sand, 10% gravel, single grained, moderate to violent CaCO3	None
37	0-9	10YR 6/3, loamy sand, 10% gravel, single-grained, moderate CaCO3	None
37	9	Bedrock encountered	None
38	0-7	10YR 6/3, loamy sand, 10% gravel, single-grained, moderate CaCO3	None
38	14	Bedrock encountered	None
38	7-14	10YR 5/4, loamy sand, 10% gravel, single grained, moderate to violent CaCO3	None
39	0-9	10YR 6/3, loamy sand, 10% gravel, single-grained, moderate CaCO3	None

Shovel Test Results, Site 5LA5612, PCMS

Shovel Test	Depth of Stratum	Stratigraphic Description	Materials Recovered
39	20	Bedrock encountered	None
39	9-20	10YR 5/4, loamy sand, 10% gravel, single grained, moderate to violent CaCO3	None
40	0-10	10YR 3/2, sandy loam, 2% gravel, single-grained, no reaction to CaCO3	None
40	10-22	10YR 3/3, sandy loam, 1% gravel, single-grained, no reaction to CaCO3	1 bulk bone (20-30 cm)
40	22-63	10YR 3/3, sandy clay loam, 25-30% gravel, weak blocky structure, no reaction to CaCO3	See STP 40, Stratum 1, charcoal (50-60 cm)
41	0-3	10YR 5/2, sandy loam, 3 % gravel, single-grained	None
41	16-50	10YR 5/3, sandy clay loam, 30% gravel, blocky with moderate development	1 bulk bone (20-25 cm)
41	3-16	10YR 5/3, sandy loam, 3% gravel, weak, blocky structure	None
41	50	Bedrock encountered	None
42	0-6	organic material from juniper trees, tumbleweed, moderate CaCO3	1 bulk bone (0-10 cm)
42	6-20	10YR 3/3, sandy loam, single-grained, moderate CaCO3	See STP 42, Stratum 1
43	0-13	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, slight CaCO3	None
43	13-34	10YR 3/3, sandy clay loam 1-5% gravel, weak development, none to slight CACO3	None
43	34-70	10YR 4/3, sandy clay loam, 0-1% gravel, more developed structure, slight CACO3	None
44	0-7	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, slight CaCO3	2 bulk bone (0-10 cm)
44	40-73	10YR 4/3, sandy clay loam, 0-1% gravel, more developed structure, slight CACO3	None
44	7-40	10YR 3/3, sandy clay loam 1-5% gravel, weak development, none to slight CACO3	

Shovel Test Results, Site 5LA5612, PCMS

Shovel Test	Depth of Stratum	Stratigraphic Description	Materials Recovered
45	0-10	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, slight CaCO3	None
45	10-40	10YR 5/4, sandy loam with roots, 0-1% gravel, single-grained, slight CaCO3	None
45	40-70	10YR 4/3, sandy clay loam, 0-1% gravel, more developed structure, slight CACO3	1 lithic flake (40-5 cm)
46	0-9	10YR 5/3, sandy loam, single-grained, 0-5% gravel, violent CaCO3	None
46	30-68	10YR 5/4, sandy clay loam, 25% gravel, blocky, weak development, violent CaCO3	
46	9-30	10YR 5/3, sandy clay loam, 5-15% gravel, blocky,	None

APPENDIX VI

FLAKE TOOLS

2003 Flake Tools Table, PCMS

Site Number	Catalog Number	Raw Material	Broken	Wgt. (g)	Cortex	Use Wear	Retouch	Tool Type
5LA03333	5LA03333.022.029	obsidian	no	1.8	0	3	1	unknown
5LA03333	5LA03333.022.030	chert	no	4	0	2	1	unknown
5LA03333	5LA03333.022.031	chert	yes	8.8	0	1	0	unknown
5LA03333	5LA03333.022.032	chert	no	5.4	0	2	1	end scraper
5LA03333	5LA03333.022.033	bright orthoquartzite	no	53.5	1	0	1	unknown
5LA03333	5LA03333.022.034	silicified wood	no	0.2	0	1	0	unknown
5LA04417	5LA04417.000.151	dull quartzite	no	16	0	3	3	unknown
5LA04417	5LA04417.000.152	bright orthoquartzite	yes	4.3	0	0	1	unknown
5LA04417	5LA04417.000.153	chert	no	6.1	1	3	1	unknown
5LA04417	5LA04417.000.154	obsidian	yes	0.2	0	2	1	unknown
5LA04417	5LA04417.000.157	bright orthoquartzite	yes	7.6	0	0	1	spokeshave
5LA04417	5LA04417.000.158	chert	yes	2.9	1	1	3	unknown
5LA04417	5LA04417.000.161	bright orthoquartzite	no	12.8	1	2	0	unknown
5LA04417	5LA04417.000.162	dull quartzite	no	5.2	1	3	0	unknown
5LA04417	5LA04417.000.163	bright orthoquartzite	no	17.9	0	0	1	unknown
5LA04417	5LA04417.000.164	chert	no	2.2	0	2	2	unknown
5LA05612	5LA05612.017.002	chert	yes	1	0	2	2	unknown
5LA06108	5LA06108.000.024	chert	no	0.6	0	2	1	unknown
5LA06108	5LA06108.000.025	chert	no	6.9	0	1	1	unknown
5LA06108	5LA06108.000.026	chert	yes	0.3	0	0	1	unknown
5LA06108	5LA06108.000.027	chert	no	5.2	0	1	1	unknown
5LA06108	5LA06108.000.028	chert	no	1.4	0	2	1	unknown
5LA06108	5LA06108.000.029	chert	no	3.1	0	1	0	unknown
5LA06108	5LA06108.000.030	chert	no	5.4	1	3	1	unknown
5LA06108	5LA06108.000.031	bright orthoquartzite	no	24.3	0	0	1	unknown
5LA06108	5LA06108.000.032	dull quartzite	no	56.3	1	1	1	unknown
5LA06108	5LA06108.000.033	chert	no	2.5	0	2	1	unknown
5LA06108	5LA06108.000.072	chert	yes	0.2	0	2	2	unknown
5LA06108	5LA06108.000.073	chert	yes	0.1	0	0	1	unknown
5LA06108	5LA06108.000.074	silicified wood	yes	1.2	0	2	1	unknown
5LA06108	5LA06108.000.075	chert	yes	0.8	1	1	0	unknown

Cortex: 0=Absent, 1=Present

Use Wear/Retouch: 0=Absent, 1=Unimarginal, 2=Bimarginal, 3=Unimarginal and Bimarginal